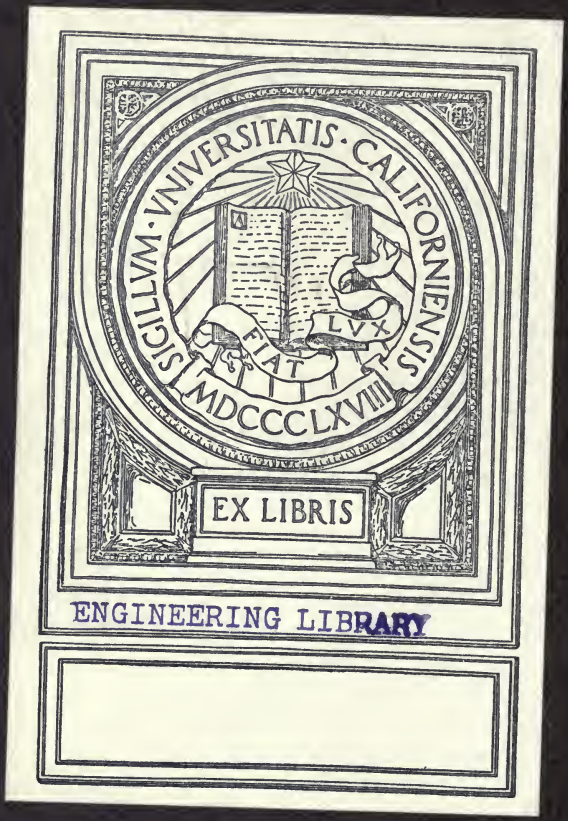

ONE THOUSAND TECHNICAL BOOKS

ONE THOUSAND TECHNICAL BOOKS

A Selected List With Annotations
Emphasizing Especially
ELEMENTARY PRACTICAL BOOKS

COMPILED BY
HERBERT L. COWING

FIRST EDITION

AMERICAN LIBRARY ASSOCIATION
LIBRARY WAR SERVICE
Washington, D. C.
June, 1919

INTRODUCTION

Purpose—This list is the outgrowth of an attempt to make a comprehensive selection of elementary practical books suitable for men without formal technical training. It was found that the number of reliable books of just this type was very limited, and that various subjects of interest to the average library and to many men in the camps were not capable of treatment from this standpoint, or were not in fact represented by such books. A number of books which it was at first supposed would be suitable for inclusion were later rejected on accout of lack of adequate revision or other objections.

The plan was therefore modified. As now compiled, the list still embodies the original purpose and **emphasizes both in selection and arrangement the elementary practical books.** It includes, however, many books of a more advanced type, and aims to provide A.L.A. representatives and public libraries with a fairly adequate basis for strengthening their technical collections in accordance with local needs. It also aims to be of help in the use of the collections they already have, and it is on this ground chiefly that many of the older but still useful books have been included. The list is believed to be a proper extension of the efforts of the A.L.A. War Service in the direction of vocational education in recent months, having in mind especially the discharged soldier and sailor and the new demands which they are making upon their home libraries.

Limitations—The list omits (1) Books for the general reader (2) Boys' books and amateur manuals (3) Most books dealing chiefly with mathematical and scientific aspects of technical subjects (4) Books on general industrial management.

No fixed date has been adopted as barring a book, but comparatively few published as early as 1910 have been included.

The following limitations should be noted:
(a) Volumes of the well known International Library of Technology (issued by the International Correspondence Schools) have not been listed under subject in most cases. It requires several volumes to cover any general subject such as Steam Engineering or Machine Shop Practice and the cost becomes a serious matter for most libraries. Moreover revisions and additions have resulted in scattering re-

lated matter in widely separated volumes in many cases, and minor subjects not infrequently begin in the middle of one volume and continue into another. The set nevertheless contains much valuable material and even the smaller libraries may advantageously purchase volumes on subjects of special local importance.

(b) The various reference sets issued by the American Correspondence School, and compiled chiefly from their individual publications, have not been listed. They are not important as library reference aids, and much material is duplicated in the various sets. Their separate publications are to be preferred for library use, and a number of them are included in this list under subject.

(c) The small booklets comprising Machinery's Reference Series have not been listed separately, except in a very few cases.

Arrangement—In order to emphasize the special purpose of the list, an attempt has been made to arrange the books under subject in order of difficulty where scope is similar; otherwise to progress from the general treatises to the limited and specialized.

As a further guide to selection, the titles that are most likely to prove useful in an average library collection have been starred. This has been done rather sparingly in the belief that the arrangement and notes will enable the librarian to increase the selection in accordance with local needs. Not all the starred titles are important to small libraries, but they are believed to be suitable if the subjects represented are locally in demand. In a few cases the same book has been entered under two subjects.

Compilation—This list is of course in some measure the result of experience in filling the requests received from camps at A.L.A. War Service Headquarters, but as a whole it is not closely representative of the camp collections.

The list has been compiled under the handicap of very limited time and it is hoped that those who use it will be disposed to take advantage of whatever good features it possesses without a too critical eye for its shortcomings.

Acknowledgments—The compiler assumes all responsibility for the list as printed and at the same time gladly acknowledges the cooperation of the following: A.L.A. Booklist, Carnegie Library of Pittsburgh, Detroit Public Library, Library of Congress, Newark Public Library, New York Public Library, Pratt Institute Free Library, Library of the United Engineering Societies, and Youngstown Public Library.

The tentative list was submitted to these libraries under conditions that rendered it impossible for them to give it adequate consideration. Not only was the time very limited, but it was impossible to send the list out as a unit. It would be an injustice to them to assume that the list as now printed represents a selection that they have approved. It has unfortunately not been possible to give full consideration to some of the suggestions received from these libraries.

NOTE

Revised editions of this list may be issued by the American Library Association Publishing Board. Librarians and others interested are invited therefore to make suggestions for the improvement of the list either by way of correcting errors, or by suggesting titles suitable for addition or omission.

George B. Utley, Secretary
American Library Association
78 E. Washington St.
Chicago, Illinois.

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ENGINEERING: BASIC SUBJECTS

APPLIED MATHEMATICS

*Dooley, W. H. Vocational mathematics. 1915. Heath $1.
Review of arithmetic followed by applications to carpentry and building, metal work, plumbing, electricity, etc.

*Palmer, C. I. Practical mathematics. 2d ed., 4v. 1918. McGraw. ea. .75.

v. 1 Arithmetic
v. 2 Geometry
v. 3 Algebra
v. 4 Trigonometry

A series of small textbooks for adult students, containing problems bearing directly on everyday work in many fields.

Hale, J. W. L. Practical applied mathematics. 1915. McGraw. $1.
Simple book intended for shop apprentices and trade school students. Applications largely to mensuration problems.

*Burnham, R. W. Mathematics for machinists. 1915. Wiley. $1.25
Arithmetic, mensuration and "shop trigonometry" (figuring angles), with applications to the machinist's daily work.

Norris, E. B. and Smith, K. G. Shop arithmetic. 1912. McGraw. $1.50.
Summary of essentials in arithmetic, with applications to machinery. A more thorough text than Burnham and intended for home study.

Burns, E. E. and Branch, J. G. Practical mathematics for the engineer and electrician. 1912. Branch. $2.
Elementary use of arithmetic, algebra and trigonometry in problems of interest to the stationary engineer.

Bromley, C. H. and Cobleigh, H. R. Mathematics for the practical engineer. 1914. McGraw. $2.
From common fractions through plain trigonometry. Appeared originally in Power.

*Norris, E. B. and Craigo, R. T. Advanced Shop Mathematics. 1913. McGraw $1.50
Covers algebra, geometry and trigonometry. A companion volume to Norris and Smith, above.

Running, T. R. Empirical formulas. 1917. Wiley. $1.40.
Treats in a clear and comparatively elementary way the derivation of empirical working formulas from experimental data.

Slide Rule

Richardson, G. W. Slide rule simplified. 1914. Author, Chic. pa. $1.
The many cuts in the text illustrating the settings as described for various operations are especially helpful.

*Rosenthal, L. W. Mannheim and Phillips slide rules. 1915. E. Dietzgen & Co., N. Y. .25
Issued by a dealer in slide rules. Very good.

APPLIED MECHANICS

Hale, J. W. L. Practical mechanics and allied subjects. 1915. McGraw $1.
Primarily for shop apprentices, and treats those phases of mechanics directly applicable to their work.

*Johnson, J. F. Practical shop mechanics and mathematics. 1915. Wiley $1.
Similar in scope and treatment to Hale.

Colvin, F. H. Machine shop mechanics; the why of things in the shop. 1911. McGraw $1.
For the average mechanic. Less a systematic text than Hale or Johnson.

*Merriman, M. Elements of mechanics. 1905. Wiley $1.
Elementary, but a more thorough development of principles than any of the above.

*Kottcahmp, J. P. Elementary mechanics for the practical engineer. 1915. McGraw $1.50
Especially for power plant engineers. Uses trigonometry.

Goodman, J. Mechanics applied to engineering. 8th ed. 1915. Longmans $3.
A good English textbook that is more comprehensive than any of the other titles listed. Includes stresses in beams and columns.

MATERIALS OF ENGINEERING

*Moore, H. F. Textbook of the materials of engineering. 1917. McGraw $2.
Good concise book on the properties and methods of production of the more commonly used materials.

Smith, A. W. Materials of machines. 2d ed. 1914. Wiley $1.25
Brief outline covering only metallic materials.

*Mills, A. P. Materials of construction; their manufacture, properties and uses. 1915. Wiley $4.50
Comprehensive treatise for students which gives much attention to stone, cement and other non-metallic materials.

Johnson, J. B. Materials of construction. 5th ed. 1918. Wiley $6.
A long-standard work which has been completely rewritten for this edition. Deals primarily with methods and machines for testing the mechanical properties of materials, but contains also a summary of essential facts about their production and general characteristics.

Leighou, R. B. Chemistry of the materials of the machine and building industries. 1917. McGraw $3.
On the composition and characteristics of a very wide range of materials, from the standpoint of the user rather than the manufacturer.

Strength of Materials

*Maurer, E. R. Strength of materials. 3d ed. 1917. Amer. technical soc. $1.
Good introduction to a working knowledge of the determination of stresses and the calculation of strength and dimensions. Contains a minimum of theory and uses simple mathematics.

*Merriman, M. Strength of materials; a textbook for secondary schools. 6th ed. 1912. Wiley $1.
Systematic elementary book which should not be confused with his advanced treatise entitled Mechanics of materials, also published by Wiley.

Murdock, H. E. Strength of materials. 2d ed. 1914. Wiley $2.
Calculus is not required though a little is introduced for completeness.

Boyd, J. E. Strength of materials. 2d ed. 1917. McGraw $3.
Requires some calculus.

Specifications

American society for testing materials. A. S. T. M. standards; issued triennially. 1918. Author, N. Y. $9.
Authoritative specifications covering the most essential points to be considered in securing materials adapted to special applications. Miscellaneous materials as well as metals are included. Individual specfications are sold for 25 cents each.

Iron and Steel

(See also Metallurgy; Structural engineering)

(Note: The general metallurgy of iron and steel is so interwoven with all consideration of these metals as engineering materials that reference must be made to the entries under Metallurgy.)

Tiemann, H. P. Iron and steel (a pocket enclycopedia) including allied industries and sciences. 2d ed. 1919. McGraw $4.

The material is alphabetically arranged and comprises explanations of terms used in all branches of the steel industry, and a summary of information on production processes, etc.

Corrosion of Iron and Steel

Wilson, L. C. Corrosion of iron; a summary of causes and preventive measures. 1915. Engineering magazine, N. Y. $2.
This is a general survey. An authoritative American work with full technical treatment is Cushman and Gardner's Corrosion and preservation of iron and steel (McGraw $4) published in 910 but still considered valuable. A more recent book is Andés' Iron corrosion (Scott, Greenwood) a German work of which the second English edition appeared in 1918.

Masonry Materials

(See also Construction Work: Building)

Richardson, C. H. Building stones and clays; a handbook for architects and engineers. 1917. Syracuse univ. book store $5.50
Well illustrated descriptive treatise on production, properties and applications.

Ries, H. Building stones and clay products; a handbook for architects. 1912. Wiley $3.
Authoritative book which gives a fuller treatment of clay products—bricks, terra cotta, hollowware and tile—than Richardson.
There is no recent American book devoted to brickmaking, and the section on bricks in this volume is perhaps the best material available. A comprehensive English work is Modern brickmaking, by A. B. Searle (1911).

Meade, R. K. Portland cement; its composition, raw materials, manufacture, testing and analysis. 2d ed. 1911. Chemical pub. co. $4.50
A standard book which includes full description of manufacturing processes and machinery.

Richards, W. A. Manual of cement testing for the use of engineers and chemists in colleges and in the field. 1912. Van Nostrand $1.50
Concise manual of methods which seeks to develop uniform practice based on the recommendations of a committee from several engineering societies.

Portland cement assn. Standard specifications and tests for Portland cement. 1916. Author, Chic. graits

U. S. Bureau of Standards. U. S. Government specification for Portland cement. (Circular 33). 3d ed. 1917. Supt. of doc. .10

Wood

Record, S. J. Mechanical properties of wood. 1914. Wiley $1.75
Plainly written, reliable book. A well illustrated section on testing apparatus and methods occupies half the volume.

***Snow, C. H.** Wood and other organic structural materials. 1917. McGraw $5.
Important book, giving information not only on woods but on preservatives, oils, gums, glues, rubber, etc.

Weiss, H. F. Preservation of structural timber. 2d ed. 1916. McGraw $3.
A standard detailed treatise.

Wagner, J. B. Seasoning of wood. 1917. Van Nostrand $2.
While chiefly devoted to seasoning processes, the book considers the properties of various timbers and the influence of seasoning upon wood as a material.

MECHANICAL DRAWING

Books Adapted to Self Instruction

*Woolley, J. W. and Meredith, R. B. Shop sketching. McGraw $1.
Gives what the shopman needs to know to interpret blue prints and make simple mechanical sketches. Not intended as a foundation for advanced drawing.

*Kenison, E. and Waite, E. B. Mechanical drawing; a practical manual of self-instruction. 1917. Amer. technical soc. $2.
This is now bound with Fairchild's Blue print reading, and is understood to be no longer available separately. The combined work will be found very useful.

Miller, H. W. and others. Mechanical drafting. 1915. Manual arts $2
Not a practice course, but a manual of concise information and instructions, of value to those lacking the personal direction of an instructor. Convenient makeup.

Richards, F. and Colvin, F. H. Practical perspective. 4th ed. Henley .50
Plainly written booklet on isometric perspective and the use of isometric paper; addressed to the average shop mechanic.

General Texts

*Crawshaw, F. D. and Phillips, J. D. Mechanical drawing for secondary schools. 1916. Scott $1.
Pt. 1 Perspective, sketching and various elementary subjects.
Pt. 2 Application of above to advanced drawing.

Weick, C. W. Elementary mechanical drawing for technical, secondary, trade and vocational schools. 1915. McGraw $1.75
A quite full text confined to elementary and basic aspects.

*Howe, C. B. Mechanical drafting. 1916. Wiley $1.75
One of the best short courses, with an unusual variety of applications.

Svensen, C. L. Essentials of drafting—for apprentice, trade and technical schools. 1918. Van Nostrand $1.50
Emphasizes the practical value of drawing as the language of engineering expression and passes quickly to practical applications.

Leeds, C. C. Mechanical drawing for trade schools. 3d ed. 1916. Van Nostrand $2.
A series of well-illustrated practical lessons. No general introductory sections on perspective, applied geometry or other basic topics. A modification of this text is issued under the title Mechanical drawing for industrial and high schools.

Reid, J. S. Mechanical drawing. 1919. Wiley $2.
A new work not the same as his Mechanical drawing, elementary and advanced which has been discontinued. A companion volume on machine drafting is planned to follow. Does not contain the special applications in his former book but gives a better course preparatory to machine drafting.

*French, T. E. Manual of engineering drawing for students and draftsmen. 2d ed. 1918. McGraw $2.50
Thorough and comprehensive. One of the most useful books for a library and considered by many the best on the subject.

Phillips, J. D. and Orth, H. D. Mechanical drawing for colleges and universities. 1915. Scott $1.75
A text in which the presentation of perspective and orthographic drawing is very good.

Collins, C. D. Drafting room methods, standards and forms; a reference book for engineering offices and draftsmen. 1918. Van Nostrand $2.

Blue print making. U. P. C. book co. $1.

Reading Blue Print Drawings

Wirick, L. A. How to read blue prints; for the use of students in industrial and vocational schools. 1917. Author, Beloit, Wis.
Very elementary.

Getty, V. C. How to read a drawing. 1912. Lippincott $1.
Brief outline. Examples chiefly from structural work.

*Fairchild, H. P. Blue print reading. 1919. Amer. technical soc. $2.
Bound with Kenison and Waite's Mechanical drawing. Short explanation of general principles, followed by detailed analyses of 36 typical blue prints (machinery with two exceptions). Folding blue prints are bound into the book.

Vigneau, E. R. How to understand the reading of blue print drawings. 1919. Educational institute, Detroit $2.
This is the fullest analysis of the blue print into its elements. Many small reproductions in the text. Probably less helpful to the average workman than Fairchild.

Lettering

*French, T. E. and Meiklejohn, R. Essentials of lettering; a manual for students and designers. 3d ed. 1912. McGraw $1.
The first part deals with the lettering of drawings; the second with artistic lettering and its application in design.

Reinhardt, C. W. Lettering for draftsmen, engineers and students. 14th ed. 1917. Van Nostrand $1.
A standard book on plain lettering for drawings.

Machine Drawing

*Hills, R. W. Machine drawing; prepared in the Extension division of the University of Wisconsin. 1917. McGraw $1.
Good elementary text for self-instruction or technical schools.

Colvin, F. H. Machine shop drawings; reading drawings, making shop sketches, laying out work. 1909. McGraw $1.

Griffin, C. L. and **Adams, C. C.** Machine drawing. 1914. Amer. technical soc. $1.50

Applications to machine details followed by full drawings for a pump and a D. C. generator.

***Low, D. A.** Introduction to machine drawing and design. New ed. 1914. Longrams .80

Concise English text of very practical character.

James, W. H. and **Mackenzie, M. C.** Working drawings of machinery. 1913. Wiley $2.

Text to follow a first year course in mechanical drawing.

KINEMATICS

James, W. H. and **McKenzie, M. C.** Principles of mechanism. 1918. Wiley $1.50

Good text for trade schools.

***Keown, R. M.** Mechanism. 1912. McGraw $2.

A college text which is clear and practical.

Furman, F. D. Elementary cams. 1916. Wiley $1.25

Mechanical Movements

***Hiscox, G. D.** Mechanical movements, powers and devices. 15th ed. 1917. Henley $3.

Cover title of this edition reads "mechanical movements, devices and appliances." A series of small cuts with descriptive text, illustrating a great variety of machine elements. The following entry deals with more complicated devices. Both are very useful to draftsmen.

Hiscox, G. D. Mechanical appliances, mechanical movements and novelties of construction. 4th ed. 1917. Henley $3.

Jones F. D. Mechanisms and mechanical movements. 1918. Industrial press $2.50

A systematic study, more valuable to the designing engineer than Hiscox's books.

MACHINE DESIGN

Wallace, E. L. Machine design, a manual of practical instruction. 1918. Amer. technical soc. $1.50

***Nachman, H. L.** Elements of machine design. 1918. Wiley $2.

Elementary textbook for technical schools assuming more knowledge of mechanics and machine drawing than Wallace does.

Spooner, H. J. Machine design, construction and drawing; a textbook for the use of young engineers. 3d ed. 1913. Longmans $3.75

Excellent English work, provided with many exercises in both calculation and drawing. Covers a wide variety of applications.

Smith, A. W. and **Marx, G. H.** Machine design. 4th ed. 1915. Wiley $3.

A college text emphasizing underlying principles.

*Leutweiler, O. A. Elements of machine design. 1917. McGraw $4.
One of the best comprehensive texts, full in treatment and in close touch with practical design.

Halsey, F. A. Handbook for machine designers, shop men and draftsmen. 2d ed. 1916. McGraw $5.
"Data and basic facts that are of constant application in machine design." Not in pocket-book form; a large volume.

Empirical Design

Marshall, W. C. Elementary machine drawing and design. 1912. McGraw $3.
Empirical treatment in which the design of machine parts by rules and formulae derived from experience is made possible without thorough understanding of principles of mechanism or mechanics of materials.

Gearing

Anthony, G. C. Essentials of gearing. 2d ed. 1911. Heath $1.60
Elementary text including a series of folding plates.

*Beale, O. J. Practical treatise on gearing. 10th ed. 1911. Brown & Sharpe mfg. co., Providence, R. I. $1.

Logue, C. H. American Machinist gear book. 1910. McGraw $2.50
Practical information and data for design and construction. Covers various types of gears.

Spur and bevel gearing. 1914. Industrial press $2.50
Full and practical treatment.

Spiral and worm gearing. 1914. Industrial press $2.50

Thomas, H. K. Worm gearing. 2d ed. 1916. McGraw $1.50
Thorough study of principles.

Butler, E. Transmission gears, mechanical, electric and hydraulic. 1918. Lippincott $2.75
As used in conjunction with internal combustion engines in automobiles, marine and other applications. See also the second volume of Heldt's Gasoline automobile.

GENERAL TOPICS

(Note: Useful information, from the vocational standpoint, on certain branches of engineering and certain trades is contained in two series of bulletins now being issued by the Government. The Federal board for vocational education has a series entitled Opportunity monographs, and the Bureau of Labor statistics a series on Descriptions of occupations. These may be obtained from the Superintendent of documents.)

McCullough, E. Engineering as a vocation. 1911. U. P. C. bk. co. $1.
Intended for students in technical schools rather than those in full college courses, but useful to both.

*Newell, F. H., ed. Engineering as a career; a series of papers by eminent engineers. 1916. Van Nostrand $1.

Davies, J. P. Engineering office systems and methods, together with schedules and instructions for the collection of preliminary data for engineering projects. . . . 1915. McGraw $5.

*Mead, D. W. Contracts, specifications and engineering relations. 1916. McGraw $3.
Much more comprehensive than Kirby or Ashbridge (below). Detailed treatment of specification writing, but brief survey of legal aspects. Considers the ethics of the profession.

Ashbridge, R. I. D. Civil engineering specifications and contracts. 1914. Amer. technical soc. $1.
General provisions and typical applications given in a way to provide a good working knowledge.

Kirby, R. S. Elements of specfiication writing. 1913. Wiley $1.25
More attention to principles and less to illustrative examples than Ashbridge. Good book based on lectures to Senior engineering students.

Allen, C. F. Business law for engineers. 1917. McGraw $3.
Seeks to give such a working knowledge of general business law and contract letting that the engineer will know when to seek professional advice.

CIVIL ENGINEERING

(Note: There is no recent American treatise on civil engineering practice as a whole, such as the librarian seeks when asked for "something on civil engineering." An English book, Manual of civil engineering practice, by F. N. Taylor (Lippincott, $7.50) is of the type desired, but of doubtful value to the inexperienced American engineer.)

International correspondence schools. Civil engineer's handbook. 1913. International textbook co. $1.25.
A small reference manual not comparable to the standard handbooks of Trautwine and others, being much more limited and elementary.

***Trautwine, J. C.** Civil engineer's pocket-book. 20th ed. 1919. Trautwine co. $6.
The most widely known and, in view of the new edition, the most advisable purchase for a library that must choose one of the standard handbooks. Contains about 350 pages more than the previous edition, largely on railroad engineering.

Merriman, M., ed. American civil engineers' pocket-book. 3d ed. Wiley $5.
The various sections were contributed by leading authorities. Contains a larger proportion of text on principles and methods than Trautwine and is perhaps better adapted to the young engineer.

Barr, W. M. Industrial engineering; a handbook of useful information. pt. 1. 1918. W. M. Barr co., N. Y. $4.
A valuable but rather special collection of data and information on engineering materials and construction details, largely based on recent specifications and practice of the U. S. Navy department. The average library will not need.

Engineering news-record. Engineer in field and office; new ideas for securing uncommonly quick, accurate and economical results. 1918. Engineering news-record.
Reprinted from the above periodical. Many branches of civil engineering are briefly represented. Apparently sold only with subscription to the periodical.

SURVEYING

Perlman, M. Rodman instructions for civil service examinations, with aids for axeman, chainman and leveler. 1914. Civil service chronicle $1.25

McCullough, E. Practical surveying, for surveyors' assistants, vocational and high schools. 1915. Van Nostrand $2.
Good thorough text on fundamentals, requiring only arithmetic and adapted to home study.

***Finch, J. K.** Plane surveying. 1918. Amer. technical soc. $1.50
A clear introductory book aiming to give a good working knowledge, including topographical work.

Pence, W. D. and **Ketchum, M. S.** Surveying manual; a manual of field and office methods for the use of students in surveying. 4th ed. 1915. McGraw $2.
Designed as a quick introduction to approved methods.

***Tracy, J. C.** Plane surveying. 1916. Wiley $3.
A text and manual that goes into greater detail and is on the whole more advanced than Pence.

Breed, C. B. and **Hosmer, G. L.** Principles and practice of surveying. 2v. 1917. Wiley $5.50
v. 1 Elementary surveying. 4th ed. $3.00
v. 2 Higher surveying. 2d ed. $2.50
One of the best full courses for students; v. 1 is not confined to very elementary phases.

Wilson, H. M. Topographic, trigonometric and geodetic surveying, including geographic, exploratory and military mapping. 3d ed. 1912. Wiley $3.50.

Stuart, E. R. Topographic drawing. 1917. McGraw $2.

Cautley, R. W. Descriptions of land; a text-book for survey students. 1913. Macmillan $1.
How to write and how to interpret the boundary descriptions in land deeds.

Mulford, A. C. Boundaries and landmarks. 1912. Van Nostrand. $1.
Intended to familiarize the surveyor with the different types of old boundaries that exist.

City Surveying

Folwell, A. P. Municipal engineering practice. 1916. Wiley $3.50
This book contains a good section of about 50 pages on city surveying. (For general annotation see p. 29). City surveying is also treated at some length in the first volume of Breed and Hosmer.

Underground Surveying

Durham, E. B. Mine surveying. 1913. McGraw $3.50
Good book on commonly used methods, assuming a previous familiarity with general surveying.

CONSTRUCTION WORK

(See also Building; Structural Engineering)

Dana, R. T. Handbook of construction plant, its cost and efficiency. 1914. McGraw $5.
Valuable compilation of information on all manner of equipment which the contractor on construction work requires.

Gillette, H. P. Handbook of cost data for contractors and engineers. 2d ed. 1910. McGraw $5.
Such data as form the basis of estimates.

Hauer, D. J. Economics of contracting. 2v. 1911-15.
McGraw ea. $2.50
Practical discussion for contractors and foremen. The second volume discusses some of the topics in the first, but in a way to supplement it.

Preparatory Operations

Gillette, H. P. Handbook of clearing and grubbing, methods and costs. 1917. McGraw $2.50

***McDaniel, A. B.** Excavation; machinery, methods and costs. 1919.
McGraw $5.
Important comprehensive treatise by the principal engineer, construction division of the army.

Cosgrove, J. J. Rock excavating and blasting. 1914.
Author, Germantown, Pa. $2.50
Gives much attention to explosives and their use.

Gillette, H. P. Handbook of rock excavation, methods and cost. 1916.
McGraw $5.

Foundations and General Masonry

(See also Building)

***International correspondence schools.** Foundation soils, statics of masonry, retaining walls, masonry arches, etc. (International library of technology, v. 109). 1910.
library of technology, v. 109). 1910. International text bk. co. $5.
This volume includes also sections on the mechanics of beams and columns.

Taylor, F. N. Masonry as applied to civil engineering; a practical treatise on the design and construction of engineering works in stone and heavy concrete. 1915. Van Nostrand $2.50
An English book illustrating a wide variety of applications.

Howe, M. A. Foundations. 1914. Wiley $1.25
Good concise introduction to the subject.

Jacoby, H. S. and **Davis, R. P.** Foundations of bridges and buildings. 1914. McGraw $5.
Comprehensive and practical; an important work.

Fowler, C. E. Practical treatise on subaqueous foundations, including the coffer-dam process for piers and dredging. 3d ed. 1914.
Wiley $7.50

Retaining Walls

Howe, M. A. Retaining walls for earth. 6th ed. 1913.
Wiley $1.25.
Concise but necessarily rather mathematical treatise on earth pressure, etc.

Hool, G. A. Retaining walls and buildings. 1913. McGraw $5.
Second volume of his Reinforced concrete construction, below.

Waterproofing

Ross, J. Waterproofing engineering for engineers, architects, builders, roofers and waterproofers. 1919. Wiley $5.
The only comprehensive book on the subject.

CONCRETE CONSTRUCTION

(See also Building)

(Note: Many useful pamphlets, obtainable free of charge, have been issued by the Portland cement association on various applications of concrete. Address them at 111 W. Washington St., Chicago.)

***Campbell, H. C.** Concrete on the farm and in the shop; a complete practical treatise on the commonest every-day uses of concrete. 1916. Henley .75
Plain directions for the average man on how to make walks, steps, low walls, etc.

Cochran, J. Reinforced concrete field book. Rev. ed. 1915. Concrete-cement age $1.
Good manual of practical instructions for the worker, but too small to be very safe in a library collection.

Campbell, H. C. Ransome book; how to make and how to use concrete. 1918 Ransome concrete machinery co., N. Y. $1.
Trade booklet which is a compilation of much valuable and very practical information for the workman and foreman.

***Lewis, M. H.** and **Chandler, A. H.** Popular handbook for cement and concrete users. 1911. Henley $2.50
Comprehensive practical manual covering both plain and reinforced concrete.

Webb, W. L. and **Gibson, W. H.** Concrete and reinforced concrete; a condensed practical treatise on the problems of concrete construction. 1916. Amer. technical soc. $1.50.

***Taylor, F. W.** and **Thompson, S. E.** Treatise on concrete plain and reinforced. 3d ed. 1916. Wiley $5.
Standard general treatise, but does not contain such full details of construction work as Hool.

Hool, G. A. Reinforced concrete construction. 3v. 1913-18 McGraw $12.50

v. 1 Fundamental principles. 2d ed. 1918	$2.50
v. 2 Retaining walls and buildings	$5.00
v. 3 Bridges and culverts	5.00

This is a very important work and most libraries will find volumes 1 and 2 at least, useful. Theory is clearly treated with comparatively slight use of mathematics. Details of standard practice are given in volumes 2 and 3.

Handbooks

Heidenreich, E. L. Engineers' pocketbook of reinforced concrete. 2d ed. 1915. McGraw $3.
Covers both design and construction of many types of work.

Hool, G. A. and Johnson, N. C. Concrete engineers' handbook of data for the design and construction of plain and reinforced concrete structures. 1918. McGraw $5.
The most complete and valuable manual.

Inspection

***Post C. L.** Building superintendence for reinforced concrete structures. 1917. Amer. technical soc. $1.
Very practical treatment under headings: substructure, superstructure, and construction equipment and material.

Cochran, J. Treatise on the inspection of concrete construction. 1913. McGraw $4.
Full treatment, with a detailed index making reference use easy.

Wig, R. J. and others. Strength and other properties of concrete as affected by materials and methods of preparation. 1916. (U. S. Bur. of standards. Technologic paper 58). Supt. of doc. .35
Pamphlet of 172 pages.

Concrete on the Farm

***Ekblaw, K. J. T.** Farm concrete. 1917. Macmillan $1.50
Practical but non-technical. Gives more space than Seaton to discussion of particular applications on the farm, and less to details of general practice in handling concrete.

Seaton, R. A. Concrete construction for rural communities. 2d ed. 1918. McGraw $2.
Useful for good, clear outline of general principles and practice as well as for special applications. See note under Ekblaw.

***U. S. Dept. of agriculture.** Farmer's bulletins 403, 561 and 481 relate to concrete on the farm. Supt. of doc. ea. .05

STRUCTURAL ENGINEERING

(See also Building)

Sprague, E. H. Elements of graphic statics; a textbook for students, engineers and architects. 1917. Van Nostrand $2.

***McCullough, E.** Practical structural design; a text and reference work . . . especially adapted to the needs of self-tutored men. 1917. U. P. C. book co. $2.50
Excellent book using only elementary mathematics. Does not take up applications to special structures.

***Burt, H. J.** Steel construction; a text and reference book covering the design of steel framework for buildings. 1914.
Amer. technical soc. $2.
Gives an adequate knowledge of the subject for the solution of the more usual design problems in practice.

Thayer, H. R. Structural design. 2v. 1912-14. Van Nostrand. $6.
v. 1 Elements of structural design $2.00
v. 2 Design of simple structures 4.00
Comparatively elementary work assuming a knowledge of mechanics and stresses. Treatment in v. 1 is of special value for emphasis on the influence of manufacturing and erecting practice on design. v. 2 includes bridges, mill buildings, high office buildings, etc.

Morris, C. T. Designing and detailing of simple steel structures. 3d ed. 1914. McGraw $2.25
Textbook of practical design with special reference to bridges, assuming a knowledge of stresses.

Kirkhan, J. E. Structural engineering. 1914. McGraw $5.
Devoted chiefly to design of simple railroad and highway bridges. Higher mathematics not used.

Ketchum, M. S. Design of steel mill buildings and the calculation of stresses in framed structures. 3d ed. 1912. McGraw $4.
A standard treatise.

Johnson, J. B., Bryan, C. W., and Turneaure, F. E. Theory and practice of modern frame structures. 3v. 1910-16. Wiley $11.
v. 1 Stresses $3.00
v. 2 Statically indeterminte structures 4.00
v. 3 Design 4.00
Authoritative work, representing the best practice in design. Volume 2 includes cantilever, arch and suspension bridges.

Handbooks

***Ketchum, M. S.** Structural engineer's handbook; data for the design and construction of steel bridges and buildings. 2d ed. 1918
McGraw $5.
Important and useful manual. Only slight changes from 1914 edition.

Cambria steel co. Cambria steel. 11th ed. 1917.
Cambria steel co., Phila. $1.25
Handbook of standard steel shapes and data for the designer and the construction engineer. Other leading steel companies issue similar manuals.

Inspection

***Belden, E. S.** Building superintendence for steel structures. 1917.
Amer. technical soc. $1.
Gives a clearer survey of the subject than Bernfeld, but contains less detail for reference.

Bernfield, L. M. Erection and inspection of iron and steel constructions. 1913. Chief pub. co. $2.
Designed to be especially helpful to inspectors and candidates for such positions.

Specifications

Carnegie steel co. Standard specifications: steel for bridges, buildings, locomotives, etc. 6th ed. 1917.
Carnegie steel co., Pittsburgh. .25.

Bridges

Wells, M. B. Steel bridge designing. 1913. McGraw $2.50
Clearly written practical text with a series of folding plates.

Kunz, F. C. Design of steel bridges; theory and practice for the use of civil engineers and students. 1915. McGraw $5.
More advanced than Wells and covers more types of bridges. Has a series of 51 folding plates.

Ketchum, M. S. Design of highway bridges. 1908. McGraw.
A letter from publisher (May 1919) states that this standard book is out of print and a new edition in preparation, but no date of publication can be set.

Waddell, J. A. L. Bridge engineering. 2v. 1916. Wiley $10.
The most complete and important American treatise.

Dilworth, E. C. Steel railway bridges, designs and weights. 1916.
Van Nostrand $4.
Intended to supplement general texts on bridge design. About two-thirds of the book consists of plates of detail drawings with data.

Foster, W. C. Wooden trestle bridges. 4th ed. 1913. Wiley $5.

Hool, G. A. Bridges and culverts. 1916. McGraw $5.
The third volume of his Reinforced concrete construction.

U. S. Office of public roads. Bulletins 43, 45, 53. Supt. of doc.
These three bulletins contain useful information on small highway bridges.

***Older, C.** Bridge manual for county superintendents of highways, resident engineers and inspectors. 1916. Author, State highway dept., Springfield, Ill.
Illustrated pamphlet of about 100 pages, on contracts and specifications, duties of inspectors, etc. Helpful information on good and faulty construction for small bridges and culverts.
Librarians should investigate the publications of their own state, but this manual is thought to be among the best for its purpose.

Structural Drawing

Edminster, C. F. Structural drawing. 2d ed. 1913.
U. P. C. book co. $2.50.
Chiefly a graded series of plates giving the student examples of structural details to study and draw.

Dufour, F. O. Structural drafting. 1913. Amer. technical soc. $1.
Contains more general information on structural work and is better adapted to use without an instructor than Edminster.

Conklin, C. D. Structural steel drafting and elementary design. 1913. Wiley $2.75

Of broader scope than Dufour or Edminster.

HYDRAULIC ENGINEERING

Merriman, M. Elements of hydraulics; a textbook for secondary technical schools. 1912. Wiley $1.

Author has written also, a standard advanced work entitled Treatise on hydraulics, which should not be confused with this book.

Daugherty, R. L. Hydraulics. 1915. McGraw $2.50

Not a difficult treatment, though a little calculus is introduced. Both this and the following title are texts well illustrated from engineering practice. Of the two, Slocum is probably more valuable to the engineer in practice.

Slocum, S. E. Elements of hydraulics. 2d ed. 1917. McGraw $2.50

***Turneaure, F. E.** and **Black, A.** Hydraulic engineering. 1912. Amer. technical soc. $3.

Practical and comparatively simple treatment by authors of high standing.

Mead, D. W. Water power engineering; the theory, investigation and development of water power. 2d ed. 1915. McGraw $5.

Full technical study of water power from the engineering standpoint. The best in its line.

Sheppard, F. Practical hydraulics for firemen. 1917. F. W. Shepperd, 154 Nassau St., N. Y. $1.

Not a difficult but a rather special treatment.

Handbooks

King, H. W. Handbook of hydraulics for the solution of hydraulic problems. 1918. McGraw $3.

Valuable manual of tables and data.

U. S. Reclamation service. Hydraulic and excavation tables. 4th ed. 1917. Supt. of doc. $1.25

Hydraulic Machinery

(See also Pumping Machinery)

Bradley, F. A. Pumping and water power. 1912. Spon. $1.50.

Aims to give a general knowledge of pumping machinery, its selection and efficient use. English.

Daugherty, R. L. Hydraulic turbines; with a chapter on centrifugal pumps. 2d ed. 1914. McGraw $2.

A general outline of theory and practice.

Daugherty, R. L. Centrifugal pumps. 1915. McGraw $2.

Principles, construction, testing, and comparison with other pumps.

Prelini, C. Dredges and dredging. 1911. Van Nostrand $3.

Dams

Bligh, W. G. Dams and weirs. 1917. Amer. technical soc. $1.50
Practical introductory work.

Smith, C. W. Construction of masonry dams. 1915. McGraw $3.
For the constructing engineer rather than the designer.

Creager, W. P. Engineering for masonry dams. 1917. Wiley $2.50
Manual of data and practical information on both design and construction.

Morrison, C. E. and **Brodie, O. L.** Masonry dam design. 2d ed. 1916. Wiley $2.50

Wegmann, E. Design and construction of dams. 6th ed. 1918. Wiley $6.
Revision of a standard detailed treatise. Includes many examples from foreign countries.

Rivers and Canals

Bellasis, E. S. River and canal engineering. 1913. Spon $2.75
Concise outline of essentials; non-mathematical.

Van Ormun, J. L. Regulation of rivers. 1914. McGraw $4.
Comprehensive treatment.

***Alvord, J. W.** and **Burdick, C. B.** Relief from floods. 1918. McGraw $2.
Engineering study of conditions and possible preventives.

Hoyt, J. C. and **Grover, N. C.** River discharge. 4th ed. 1916. Wiley $2.
Methods of measurement and interpretation of results as affecting water power projects.

***Bakenhus, R. E., Knapp, H. S.** and **Johnson, E. R.** Panama canal; its history and construction, and its relation to the navy, international law and commerce. 1915. Wiley $2.50.
Reliable and concise.

Goethals, G. W. Panama canal; an engineering treatise. 2v. 1916. McGraw $7.50
The authoritative work on engineering details.

Harbors, Docks, Etc.

Cunningham, B. Principles and practice of harbor engineering. 2d ed. 1918. Lippincott $7.50
Standard English work.

Greene, C. Wharves and piers; their design, construction and equipment. 1917. McGraw $3.

MacElwee, R. S. Ports and terminal facilities. 1918. McGraw $3.
Economic aspects and engineering equipment.

Matthews, E. R. Coast erosion and protection. 1913. Lippincott $3.50
An English work.

Irrigation Engineering

Newell, F. H. and **Murphy, D. W.** Principles of irrigation engineering. 1913. McGraw $3.
Broad, comparatively non-technical treatment.

***Davis, A. P.** and **Wilson, H. M.** Irrigation engineering. 1919. Wiley $4.50
A revision of Wilson's Irrigation engineering (6th ed. 1909.) Full engineering details from recent practice.

Etcheverry, B. A. Irrigation practice and engineering. 3v. 1915-16. McGraw $9.50

v. 1 Use of irrigation water and irrigation practice	$2.00
v. 2 Conveyance of water	3.50
v. 3. Irrigation structures and distribution systems.	4.00

Important series, covering the subject fully from many angles.

Davis, A. P. Irrigation works constructed by the U. S. government. 1917. Wiley $4.50
A description with engineering data.

Fleming, B. P. Practical irrigation and pumping. 1915. Wiley $2.
Treats those aspects of irrigation bearing on the equipment and operation of pumping stations.

***Fortier, S.** Use of water in irrigation. 2d ed. 1915. McGraw $2.
Non-technical, adapted to the farmer.

Land Drainage

***Jeffery, J. A.** Textbook of land drainage. 1916. Macmillan $1.25
Non-technical treatment adapted to the practical farmer rather than the professional engineer.

Elliott, C. G. Engineering for land drainage; a manual for the reclamation of lands injured by water. 2d ed. 1912. Wiley $2.

Parsons, J. L. Land drainage; a treatise on the design and construction of open and closed drains. 1915. McGraw $1.50
Gives much attention to specifications, inspection and cost data as well as to construction work.

Woodward, S. M. Land drainage by means of pumps. (U. S. Department of agriculture. Bul. 304). 1915. Supt. of doc. .10

Warren, G. M. Tidal marshes and their reclamation. (U. S. Office of experiment stations. Bul. 240). 1911. Supt. of doc. .35.

Yarnell, D. L. Excavating machinery used in land drainage. U. S. Department of agriculture. Bul. 300). 1915. Supt. of doc. .05.

Yarnell, D. L. Trenching machinery used for the construction of trenches for tile drains. (U. S. Department of agriculture. Farmer's bul. 698). 1915. Supt. of doc. .05.

MUNICIPAL AND SANITARY ENGINEERING

*Merriman, M. Elements of sanitary engineering. 4th ed. 1918. Wiley $2.
Presents in a simple but authoritative treatment the subjects of water supply, sewerage and refuse disposal.

Folwell, A. P. Municipal engineering practice. 1916. Wiley $3.50
A book which omits water supply, sewerage and pavements and covers many topics not so readily accessible elsewhere, such as city plan, street surface details, city surveying, disposal of wastes, etc.

Folwell, A. P. Practical street construction. 1917. Municipal journal, N. Y. $2.
Deals not with pavements but with street planning, grades and intersections, location of sewers and of hydrants, etc.

Lyle, W. T. Parks and park engineering. 1916. Wiley $1.25
Designed especially for the young engineer, but suitable for responsible city officials and others.

WATER SUPPLY

(See also Plumbing)

*Hazen, A. Clean water and how to get it. 2d ed. 1914. Wiley $1.50
Non-technical introductory survey. Suitable for city officials.

Rideal, E. K. Water supplies. 1914. Appleton $2.50
An English work chiefly on purification methods. Not highly technical.

Mason, W. P. Water supply (considered principally from a sanitary standpoint). 4th ed. 1916. Wiley $3.75

Stein, M. F. Water purification plants and their operation. 1915. Wiley $2.50

Wiley $3.50

*Ellms, J. W. Water purification. 1917. McGraw $5.
Authoritative, clear and systematic work.

Race, J. Chlorination of water. 1918. Wiley $1.50

Water Analysis

Mason, W. P. Examination of water, chemical and bacteriological. 5th ed. 1917. Wiley $1.25

American public health assn. Standard methods for the examination of water and sewage. 3d ed. 1917. Author, Boston $1.25

Water Supply Engineering

Turneaure, F. E. Water supply. 1908. Amer. technical soc. $1.
Outline by an authority, which needs supplementing on recent practice.

*Folwell, A. P. Water supply engineering. 3d ed. 1917.
A standard general book, the best for a library collection.

Flinn, A. D., Weston, R. S. and **Bogert, C. L.** Waterworks handbook. 1916. McGraw $6.
Comprehensive manual of practical information and data on sources, collection, transportation, distribution and treatment of water.

Wegmann, E. Conveyance and distribution of water for water supply: aqueducts, pipe-lines and distributing systems. 1918. Van Nostrand. $6.

White, L. Catskill water supply of New York City. 1913. Wiley $6.
Full description, with technical data, of a notable engineering achievement.

Hazen, A. Meter rates for water works. 1918. Wiley $2.25
Thorough study of economic and engineering factors that should form the basis of fair rates.

Rural Water Supply

Lynde, C. J. Home waterworks; a manual of water supply in country homes. 1911. Sturgis $1.
Explains the methods and apparatus available at small expense. Costs as given no longer apply.

*Trullinger, R. W. Water supply, plumbing and sewage disposal for country homes. (U. S. Dept. of agriculture. Bul. 57). 1914. Supt. of doc. .10
Well illustrated bulletin of 46 pages giving the information clearly but with the necessary practical details.

*Fuller, M. L. Domestic water supplies for the farm. 1912. Wiley $1.50
Sources of supply, well-drilling, etc. Does not duplicate Lynde.

SEWERAGE

Marston, A. and **Fleming, T.** Sewers and drains (including sewage disposal). 1917. Amer. technical soc. $1.
Designed to give an introductory working knowledge. Differs from the 1909 publication by the addition of some 50 pages on sewage disposal.

Ogden, H. N. Sewer design. 2d ed. 1913. Wiley $2.25
Well known book. Fuller treatment in Metcalf and Eddy below.

*Folwell, A. P. Sewerage; the designing, constructing and maintaining of sewerage systems and sewage treatment plants. 8th ed. 1918. Wiley $3.
A standard general work.

Metcalf, L. and **Eddy, H. P.** American sewerage practice. 3v. 1914-16. McGraw $15.

v. 1 Design of sewers	$5.00
v. 2 Construction of sewers	4.00
v. 3 Disposal of sewage. 2d ed.	6.00

Sewage Disposal

Kershaw, G. B. deB. Sewage purification and disposal. 1915. Putnam $3.75

Good English book. Semi-popular survey adapted to responsible officials and students.

***Kinnicutt, L. P., Winslow, C. E. A.** and **Pratt, R. W.** Sewage disposal. 2d ed. 1919. Wiley $4.

Comprehensive practical treatment. (See also third volume of Metcalf and Eddy.)

Daniels, F. E. Operation of sewage disposal plants. 1915. Municipal journal, N. Y., $1.50

***Warren, G. M.** Sewage disposal on the farm. (U. S. Department of agriculture. Yearbook separate 712). 1917. Supt. of doc. .05

Ogden, H. N. and **Cleveland, H. B.** Practical methods of sewage disposal for residences, hotels and institutions. 1912. Wiley $1.50

Refuse and Refuse Disposal

Capes, W. P. and **Carpenter, J. D.** Municipal housecleaning; methods and experiences of American cities in collecting and disposing of their municipal wastes—ashes, rubbish, garbage, manure, sewage and street refuse. 1918. Dutton $6.

Comprehensive discussion and collection of data, based on the contents of many annual reports and special publications.

Morse, W. F. Collection and disposal of municipal waste. 1909. Municipal journal, N. Y. $5.

There is no later American book that is equally full and important on the technical side. Includes disposal by incinerators, by English destructor systems, and by reduction and extraction processes.

ROADS AND PAVEMENTS

Drainage Methods and Foundations for Country Roads

(Note: The U. S. Bureau of public roads issues many practical bulletins, obtainable at low prices from the Superintendent of documents at Washington. For example, a recent 86 page bulletin by E. W. James and others, entitled Drawings, methods and foundations for country roads, is sold for 20 cents.)

***Foote, C. E.** Practical road building. 1917. McKay $1.25

Reliable semi-popular book, particularly suitable for responsible county officials and local improvement organizations.

Byrne, A. T. Modern road construction; a practical treatise on the engineering problems of road building. 1917. Amer. technical soc. $1

By an engineer of long experience.

*Goodell, J. M. Location, construction and maintenance of roads; reprinted from Goodroads yearbook 1917. 1918.
Van Nostrand. $1.50

Written to provide reliable and detailed information on the best practice applicable to work on state highways.

Blanchard, A. H. Elements of highway engineering. 1915.
Wiley $3.

Textbook for civil engineering students, in part adapted from a much more exhaustive work by Blanchard and Drowne (Wiley $4.50). Both are excellent books and give special attention to bituminous materials and their applications.

*Agg, T. R. Construction of roads and pavements. 1916.
McGraw $3.

Though written as a college text-book, this is one of the very best books on practice.

Baker, I. O. Treatise on roads and pavements. 3d ed. 1917.
Wiley $4.50

Thorough revision of a standard comprehensive book, which treats the subject for the practicing engineer. Pavements are fully treated in part 2 of this book.

Handbooks

Harger, W. G. and Bonney, E. A. Highway engineers' handbook. 3d ed. 1919. McGraw $3.

A valuable reference handbook for the engineer in charge of road construction. City pavements are not included.

Blanchard, A. H., ed. American highway engineers' handbook. 1919.
Wiley $5.

Authoritative and enclyclopedic reference manual covering not only roads and pavements but many related topics. Full index and valuable bibliographies, including recent periodical material. A book for the engineer's office rather than for the man directing or inspecting actual construction.

Pavements

(Note: Many libraries will find a special book on pavements unnecessary, as the subject is covered in various books on highway engineers.)

Tillson, G. W. Street pavements and paving materials. 2d ed. 1912.
Wiley $4.

A standard general treatise covering the various types.

Richardson, C. Asphalt construction for pavements and highways; a pocketbook for engineers, contractors and inspectors. 1913.
McGraw $2.

Manual of instructions, suggestions and data, plainly presented to give an understanding of the best practice.

RAILROAD ENGINEERING

***Raymond, W. G.** Elements of railroad engineering. 3d ed. 1917. Wiley $4.

Reliable general study of a railroad from the engineering point of view—its permanent way, locomotive performance as affecting grades and general layout, preliminary and later surveys, etc.

Webb, W. L. Railroad construction, theory and practice; a text-book for the use of students . . . and a hand-book for the use of engineers in field and office. 6th ed. 1917. Wiley $4.

A standard manual summarizing each branch of work from the survey to the full operating equipment.

Crandall, C. L. and **Barnes, F. A.** Railroad construction. 1913. McGraw $3.

Does not cover so broad a field as Webb, but is a good book on construction practice relating to earth and rock work, tunneling, masonry, small bridges, etc.

Orrock, J. W. Railroad structures and estimates. 2d ed. 1918. Wiley $5.

Important book containing information on quantities of materials and costs that enter into every sort of railroad construction work.

Haines, H. S. Efficient railway operation. 1919. Macmillan $4.

Authoritative work for technical students and railroad employees describing present methods of efficient practice in operation (as distinguished from administration and finance) and the stages of progress through which these methods have been developed.

Rench, W. F. Simplified curve and switch work, a collection of valuable points for the supervisor and foreman and for college instruction. 1916. Railway educational press $1.50.

Explanations and rules that solve problems in this class of work without higher mathematics. Author is a supervisor with the Pennsylvania R. R.

Searles, W. H. and **Ives, H. C.** Field engineering. 18th ed. 1919. Wiley $3.

A widely used manual of principles and formulae for railroad surveyors and field engineers, on curves, grades, crossings, earth work, etc. Part 2 consists of tables, and the parts are sold separately at $2 each.

Allen, C. F. Railroad curves and earth work, and field and office tables. 2 v. in 1. 1914. McGraw $3.

For the engineer engaged in track location.

Tunneling

Prelini, C. Tunneling. 6th ed. 1912. Van Nostrand $3.

General treatment, with considerable attention to tunnels for subways and under water.

Lauchli, E. Tunneling. 1915. McGraw $3.

General, but gives most attention to railroad tunnels. Concise treatment with many practical details.

Brunton, D. W. and **Davis, J. A.** Modern tunneling, with special reference to mine and water supply tunnels. 1914. Wiley $3.50

Track Work

(Note: The most detailed work, a recognized authority, is Camp's Notes on track. There has been no revision since 1904.)

Van Auken, K. L. Practical track work. 2d ed. 1916. Railway educational press $1.50.

Van Auken, K. L. Practical track maintenance. 1916. Railway educational press $1.60.

Lewis, E. R. Winter track work. 1917. Railway educational press $1.60

These three books are written for the trackman and foreman, and omit the problems of the engineer in laying out track. The first is on construction work, the second on maintenance and repair, and the third on special methods to meet winter weather conditions.

***Dana, R. T.** and **Trimble, A. F.** Trackman's helper. 1917. McGraw $2.

Based on a book originally written by J. Kindelan and since revised by various authors. A fairly complete manual of practice for track foremen and supervisors.

Tratman, E. E. R. Railway track and track work. 3d ed. 1908. McGraw $3.50.

A standard work for the engineer, not the trackman.

Maintenance and Repair

***Sellew, W. H.** Railway maintenance engineering, with notes on construction. 1915. Van Nostrand $2.50.

A well illustrated textbook, with references to more specialized material. Covers in a very practical way the track, structures and other equipment of an established railroad, with reference to their maintenance and improvement.

Willard, W. C. Maintenance of way and structures. 1915. McGraw $4.

The most complete work in this field.

Electrification of Steam Railroads

Burch, E. P. Electrification of railway trains. 1911. McGraw $5

Comprehensive treatise with full engineering details.

International correspondence schools. Electric locomotives, etc. (International library of technology, v. 112). 1911. International textbook co. $5.

This volume treats of the operation of electric locomotives and electric trains.

Locomotive Engineering

Wood, A. J. Principles of locomotive operation and train control. 1915. McGraw $3.
A textbook on the acceleration and resistance of trains, control by airbrakes, fuel economy, and principles of the locomotive engine, etc., including a short chapter on electrification of steam railways.

Lockhart, C. F. Practical instructor and reference book for locomotive firemen and engineers. 1916. Henley $1.50.
Explains construction of the locomotive, breakdowns, Westinghouse air brake, locomotive running. Test questions on each subject are grouped at the end of the volume. Reissue of 1911 edition.

Sinclair, A. Locomotive engine running and management. 23d ed 1915. Wiley $2.
A standard treatise plainly written. Includes examination questions, but much of the book is general descriptive text.

***Prior, F. J.** Practical locomotive engineering; firing, running, breakdowns, mechanical and air brake, as comprised in the serial (1st, 2d and 3d) examination questions and answers. 1918. Federal railway institute. $2.25.
A catechism with very good index.

MacDonald, J. R. Treatise covering operation, defects and remedies of the locomotive, Westinghouse and New York air brake; also questions and answers to first, second and third year's progressive examinations. 1917. Author, Chicago $2.25.
The author has had much experience in coaching locomotive firemen for promotion. The whole book is in the form of questions and answers and those on air brakes occupy more than half the volume.

***Swingle, C. F.** Cyclopedia of locomotive engineering, with examination questions and answers. 1916. Drake $3.
Comprehensive manual. Each section is followed by test questions, the answers to which are readily found in that section, but are not given directly in spite of the wording of the title.

James, W. P. Enginemen's manual. 1918. W. P. James pub. co., Louisville. $2.50.
Not logically arranged and not well-indexed, but treats many details and accessory appliances not covered in most manuals. "Catechism" treatment.

Forney, M. N. Forney's catechism of the locomotive, part 1. 3d ed. 1912. Railway age gazette, N. Y. $3.
Revision of an old standard, very widely known. A catechism in which the answers contain much detail. V. 2 is theoretical and less generally used.

Fowler, G. L. Locomotive breakdowns, emergencies and their remedies; an up-to-date catechism. 8th ed. 1916. rev. by W. W. Wood. Henley $1.
Questions and answers, grouped by part of mechanism affected.

Locomotive Valves

McShane, C. L. Modern locomotive valves and valve gears. 1917. Griffin & Winters $2.50.

Elementary treatment assuming no working knowledge of the subject. A less important book than Yoder and Wharen.

***Yoder, J. H.** and **Wharen, G. B.** Locomotive valves and valve gears, with a special treatise on valve setting. 1917. Van Nostrand $3.

Plainly written but thorough book based on instruction to shop apprentices of the Pennsylvania R. R. Numerous good diagrams.

Train Operation

American railway assn. Standard code of train rules for single and double track. 1916. Author, N. Y. .70.

Collingwood, G. E. Train rule examinations made easy. 2d ed. 1917. Henley $1.25.

Simple explanation of the standard rules, followed by questions and answers. Contains diagrams of hand, flag and lamp signals.

***Prior, F. J.** Operation of trains and station work, and telegraphy. 1916. Drake $1.50.

For the conductor, trainmaster and brakeman. Does not cover locomotive operation. Train heating and lighting, signals, train orders, etc.

Nichols, W. Train operation; a treatise on train rules, train orders, change of time table, automatic block signals, interlocking. 1916. LeGrand Brown, Rochester, N. Y. $2.

Thorough and detailed book, with questions and answers. Author was for ten years chairman of the Board of examiners of a large railroad. Track diagrams with signals in color are a valuable feature.

Railroad Signals

(Note: The operation of signals is quite fully covered in Nichols' Train operation, above.)

Scott, R. Automatic block signals and signal circuits; American practice in the installation and maintenance of signals electrically controlled. 1908. McGraw $2.50.

Anderson, J. Electric locking. 1918. Simmons-Boardman pub. co. $2.

A general study of the system of electrical control which prevents the changing of a signal until certain conditions necessary to safety have been fulfilled.

General railway signal co. Electric interlocking handbook. 1913. Author, Rochester, N. Y. $3.

Chiefly details of apparatus and circuits, with a large number of diagrams and illustrations.

Air Brakes

(Note: The construction and operation of the airbrake is explained in most of the books on the locomotive. Also, the manufacturers issue instruction handbooks.)

Ludy, L. V. Air-brake. 1913. Amer. technical soc. $1.
The Westinghouse system is described and illustrated. A short section deals with its application to electric cars.

Westinghouse air brake system. 1915. Drake $2.
A detailed treatise in plain language, compiled with the aid of several experts. Many questions and answers are included.

International correspondence schools. Westinghouse air-brake handbook. 2d ed. 1918. Internat. textbook co. $1.
Construction and operation of the Westinghouse equipment of various types are explained, and names and identification numbers of parts are given. Not an outline of operation for the train crew but a useful handbook for the repairman and others.

New York air brake system. 1911. Drake $2.
A full treatment similar to that on the Westinghouse system, above.

Railroad Terminals

Droege, J. A. Freight terminals and trains. 1912. McGraw $5.
Full and authoritative work on layout, construction and equipment of yards and terminal structures.

Droege, J. A. Passenger terminals and trains. 1916. McGraw. $5.

Railroad Shops

Jones, F. D. Railway repair shop practice. 1912.
Industrial press .25.
This is Machinery's reference series no. 90.

Wright, R. V., comp. Railway shop kinks. 1911.
Railway age gazette, N. Y. $2.
Based on articles contributed to the Railway age gazette from 1909 to 1911. A large volume of nearly 300 pages, with a great number of line drawings and half tones.

MECHANICAL ENGINEERING

ENCYCLOPEDIA

*Machinery's encyclopedia; a work of reference covering practical mathematics and mechanics, machine design, machine construction and operation; electrical, gas, hydraulic, and steam power machinery; metallurgy and kindred subjects in the engineering field. 7v. 1917. Industrial press $36.

A very valuable work, though not a complete cyclopedia of engineering; especially strong on all that relates to machine shop practice and metal working processes generally. Even rather small libraries will find it a useful purchase, if located where these subjects are of special importance.

HANDBOOKS

Kent, W. Mechanical engineers' pocketbook. 9th ed. 1916. Wiley $5.

This has long been a standard reference manual, covering the whole field of mechanical engineering.

*Marks, L. S., ed. Mechanical engineers' handbook. 1916. McGraw $5

A recent rival of Kent. Many specialists have contributed to the book which is more systematic and comprehensive than Kent and on the whole preferable where only one can be bought.

Gillette, H. P. Handbook of mechanical and electrical cost data. 1918. McGraw $6.

Voluminous collection of notes and data for "the designer, appraiser, chief of construction, superintendent of operation, engineering student." Only the larger libraries are likely to need this.

MECHANICAL PROCESSES

*Danforth, G. W. Elementary outline of mechanical processes. 1917. U. S. Naval institute $3.75

Gives a general outline of metal-producing processes followed by a description of the methods of "re-manufacture" and working in the foundry, forge, machine shop, boiler shop and various special processes.

Charnock, G. F. Mechanical technology; being a treatise on the materials and preparatory processes of the mechanical industries. 1915. Van Nostrand $3.

Excellent and well illustrated English book. Differs in scope from Danforth by the inclusion of various non-metallic materials and by omission of the work of the machine shop and other finishing processes. Describes very fully the work of the foundry and forge, with much attention to machine moulding and heavy forging.

POWER AND POWER TRANSMISSION

Lucke, C. E. Power. 1911. Lemcke $2.
A series of college lectures in non-technical language on the development of "apparatus and machinery for the converting of natural energy in any of its available forms into useful work."

***Kerr, E. W.** Power and power transmission. 3d ed. 1914. Wiley $2.
Plainly written textbook on the generation of power from various sources, and on the machinery of transmission—shafting, belts, gearing, etc.

Collins, H. E. Shafting, pulleys, belting and rope transmission. 1908. McGraw $1.
Information and hints helpful to all who have to handle such equipment.

Kent, R. T. Leather belting. 1916. Wiley $1.25
A somewhat technical study of data and methods based on the requirements of modern high speed production.

Power (periodical) Power kink book. 1917. McGraw $1.75
———————Second Power kink book. 1918. McGraw $1.
Two collections of suggestive short cuts and convenient devices, in connection with the machinery of all kinds to be found in a power plant. Compiled from recent volumes of Power.

Lubrication

Battle, J. R. Lubricating engineer's handbook. 1916. Lippincott $4.
Comprehensive work in which general information and data on lubrication and various lubricants is followed by studies of the lubrication problems of many types of machinery.

***Lockhart, L. B.** American lubricants from the standpoint of the consumer. 1918. Chemical pub. co. $2.
Intended to aid in a more intelligent selection and use of lubricating oils and greases. Gives much space to test methods and specifications, in addition to a general study of friction and lubricating problems.

TESTING

Smallwood, J. C. Mechanical laboratory methods; the testing of instruments and machines in the mechanical laboratory and in practice. 2d ed. 1918. Van Nostrand $5
Concise treatment, omitting details of testing apparatus.

Tenney, E. H. Test methods for steam power plants. 1915. Van Nostrand $2.50
Practical methods for working conditions.

***Moyer, J. A.** Power plant testing. 2d ed. 1913. McGraw $4
More general than its title implies and more complete than Smallwood.

Carpenter, R. C. and **Diederichs, H.** Experimental engineering and manual for testing. 7th ed. 1911. McGraw $6.
A standard work giving greater detail than Smallwood or Moyer which cover a broader field.

MILLWRIGHTING AND MECHANICAL EQUIPMENT OF BUILDINGS

Hawkins, N. Erecting and operating . . . for constructing engineers, millwrights and master builders. 1913. Audel $2.
Tools, equipment and methods are described and illustrated in a manner adapted to the average workman.

Swingle, C. F. Practical handbook for millwrights, describing the planning and arrangement of mill buildings. 1913. Drake $2.
Fewer illustrations and less description of tools and the most elementary matters than Hawkins, but also addressed to the average workman.

***Hobart, J. F.** Millwrighting. 1909. McGraw $3.
The best and most authoritative.

Collins, H. E. Erecting work. 1908. McGraw $1.
Limited scope compared with the other entries under this head. Moving and installing heavy machinery.

Hoisting and Conveying Machinery

Zimmer, G. F. Mechanical handling and storing of material . . . by automatic or semi-automatic machinery. 1916. Van Nostrand $12.50
An expensive work, but one that contains material not readily found elsewhere. Very fully illustrated.

Elevators

(Note: Some instruction on operation of elevators is contained in v. 10 of Hawkins' Electrical guide, in v. 8c of the International library of technology, and in Swingle's and other handbooks for stationary engineers.)

Jallings, J. H. Elevators . . . hand, belt, steam, hydraulic and electric. 1918. Amer. technical soc. $2.
Treats of the development of the several types, design, operation, layout of auxiliary apparatus, etc. The only book that includes all types, but it does not give much attention to operating.

Henderson, E. G. Electric elevators, their construction and operation. 1915. Branch $1.
For the mechanic and not the designer.

Cullmer, H. R. Elevator shaft construction. 1912. Comstock $3.
For the architect and builder.

COMPRESSED AIR

Wightman, L. I. Compressed air. 1919. Amer. technical soc. $1.
Aims to give a general working knowledge. Describes many types of compressors and other apparatus but it is not a very thorough introduction to the subject.

Simons, T. Compressed air. 1914. McGraw $1.50
A book on principles, illustrated by examples of practice and provided wtih many problems for solution. Good for a thorough introduction to the subject.

***Hirshberg, C. A.** Compressed air for the metal worker. 1917. McGraw $3.
Excellent book explaining air compression apparatus and applications to portable tools, uses in machine shop, foundry and forge, sand blasting, hoisting and conveying, etc. Very fully illustrated.

Richards, F. Compressed air practice. 1913. McGraw $3.
Authoritative treatise for engineers, more general than Peele.

Poole, R. Compressed air plant; the production, transmission and use of compressed air, with special reference to mine service. 3d ed. 1919. Wiley $4.25
A standard work, especially valuable for important chapters on rock drills, hammer drills, coal cutting machinery, and on use of compressed air for pumping and haulage.

REFRIGERATION

Sydney, S. Mechanical refrigeration. 1913. Branch $2.
Elementary practical book (slight for the price) designed for the operating engineer who may have to handle a refrigerating plant.

Booth, C. E. Audel answers on refrigeration and ice making; a practical treatise with illustrations. 1914. Audel $2.
Elementary book for the operator of refrigerating machinery, treating the subject throughout in the form of questions and answers.

Cosgrove, J. J. Sanitary refrigeration and ice making. 1914. Standard sanitary mfg. co. $3.
Reliable and fairly full elementary treatment from the practical standpoint.

***Arrowood, M. W.** Refrigeration; a practical treatise on the production of low temperature as applied to the manufacture of ice, and to the design and operation of cold storage plants. 1916.
Principles briefly covered, apparatus and methods explained in considerable detail. Only about 35 pages on cold storage. A useful working guide.

Macintire, H. J. Mechanical refrigeration; a treatise for technical students and engineers. 1914. Wiley $4.
The best comprehensive American work for the trained engineer.

Greene, A. M. Elements of refrigeration; a textbook for students, engineers and warehousemen. 1916. Wiley $4.
A rather advanced presentation of the principles and data which are the bases of design and operation.

Harding, L. A. and **Willard, A. C.** Power plants and refrigeration. 1917. Wiley $5.
(This is the second volume of their Mechanical equipment of buildings, an important reference work for engineers and architects, treating the subjects from the standpoint of design and installation.

Cold Storage

Cooper, H. Practical cold storage. 2d ed. 1915. Nickerson $3.50
Exhaustive treatise of 800 pages, with details of the application of cold storage to the preservation of dairy products, fruit, poultry, etc. Important section on insulation.

MACHINE SHOP PRACTICE

Hartman, W. B. Machine shop practice. 1917. Appleton $1.10
Reliable elementary book which describes the more usual machines and processes. Treatment too brief to be more than an introduction to each class of work.

***Beale, O. J.** Handbook for apprenticed machinists. 3d ed. 1917. Brown & Sharpe mfg. co., Providence, R. I. .50
A booklet emphasizing certain facts and principles that the inexperienced should keep constantly in mind. Not a general survey such as Hartman.

Fairfield, H. P. and **Dow, C. S.** Starrett book for machinists' apprentices. 4th ed. 1918. L. S. Starrett co., Athol, Mass. .50
Special emphasis on how to lay out work. Does not duplicate the Brown & Sharpe manual.

Kaup, W. J. Machine shop practice. 2d ed. 1914. Wiley $1.25
Good elementary text for trade schools.

Turner, F. W., Perrigo, O. E. and **Fairfield, H. P.** Machine shop work; a comprehensive manual of approved shop methods. 1917. Amer. technical soc. $1.50

***Halsey, F. A.** Methods of machine shop work, for apprentices and students in technical and trade schools. 1914. McGraw $2.50
A standard book emphasizing principles and the interrelation of various processes. Assumes familiarity with machine shop terms and the common machines, but is an elementary treatment.

Smith, R. H. Textbook of the principles of machine work. 3d ed. 1919. Industrial education book co. $3.

***Smith, R. H.** Textbook of advanced machine work. 5th ed. 1919. Industrial education book co. $3.
Excellent texts for technical schools and colleges, illustrated with a great number of specially prepared small diagrams and valuable for very specific and detailed directions for executing various processes. Helpful also to practical machinists, but not adapted to continuous reading for a general introduction to machine work.

Leonard, W. S. Machine shop tools and methods. 6th ed. 1911. Wiley $4.
A standard work on fundamental processes and types of tools.

Oberg, E. V. Handbook of small tools. 1908. Wiley $3.
On hand taps, reamers, threading dies, milling cutters, etc.

Suverkrop, E. A., comp. American machinist shop note book. 1919. McGraw $2.

A "kink book" comprising short articles from the files of American machinist, describing special devices and methods. Very suggestive to the machinist.

Handbooks

(Note: A large proportion of the booklets in Machinery's reference series relate to machine shop work. Small libraries will find that in many cases they will cover a subject with sufficient fullness for local needs.)

Fairchild, H. P. and **others.** Starrett data book for machinists. 1918. L. S. Starrett co., Athol, Mass. .50

Useful trade publication of rather limited scope.

***Colvin, F. H.** and **Stanley, F. A.** American machinist's handbook and dictionary of shop terms. 2d ed. 1914. McGraw $3.

A standard and widely used manual.

Machinery's handbook for machine shop and drafting-room; a reference book on machine design and shop practice. 1914. Industrial press $5.

The most comprehensive reference handbook for machinists. Covers some related subjects not included in Colvin and Stanley.

Lathes and Screw Machines

Colvin, F. H. Engine lathe work. 1909. McGraw $1.

On principles and fundamental features of lathes, for apprentices and others. Still serviceable.

Perrigo, C. O. E. Lathe design, construction and operation, with practical examples of lathe work. 1916. Henley $2.50.

Excellent comprehensive book.

***Jones, F. D.** Turning and boring 1915. Industrial press $2.50

Much the greater part is on lathes and lathe work.

Hamilton, D. T. and **Jones, F. D.** Automatic screw machines. 1916. Industrial press $2.50

Colvin, F. H. and **Stanley, F. A.** Screw machine kinks. 1908. McGraw .60

Jones, F. D. Thread cutting methods. 1918. Industrial press. $2.50

Comprehensive treatise including thread rolling and precision screw threads.

Colvin, F. H. and **Stanley, F. A.** Screw thread kinks. 1908. McGraw .60

Drilling Machines

Oberg, E. V. and **Jones, F. D.** Drilling practice and jig design. 1915. Industrial press $2.50

Colvin, F. H. and Stanley, F. A. Drill press kinks. 1908. McGraw .60

Viall, E. Broaches and broaching. 1918. McGraw $2.

Planing Machines

Cincinnati planer co. Treaties on planers, practical information and suggestions. 1912. Author, Cincinnati .50
Useful trade publication.

Jones, F. D. Planing and milling. 1914. Industrial press $2.50
About one third is on planing.

Milling Machines

*Cincinnati milling machine co. Treaties on milling and milling machines. 1916. Author, Cincinnati $1.50
Unusually valuable trade publication.

Jones, F. D. Planing and milling. 1914. Industrial press $2.50
About two thirds on milling.

Colvin, F. H. and Stanley, F. A. Milling machine kinks. 1908. McGraw .60

Gear Cutting

(See also books on Gearing under Machine design)

Flanders, R. E. Gear-cutting machinery, comprising a complete review of contemporary American and European practice. . . . with the principles involved. 1909. Wiley $2.50
Thorough and at the date of publication very complete.

Horner, J. G. Gear-cutting in theory and practice. 1914. Van Nostrand $3.
Good English book.

Grinding

Colvin, F. H. and Stanley, F. A. American machinist grinding book. 1912. McGraw $3.

Hamilton, D. T. and Jones, F. D. Advanced grinding practice. 1915. Industrial press $2.50

Toolmaking

(See also Dies; Forging; Heat Treatment of Steel)

*Markham, E. R. Tool-making; a practical treatise on the art of making tools, jigs and fixtures, with helpful suggestions on heat treatment. 1916. Amer. technical soc. $1.50
The best book on the subject for general use.

Jones, F. D., ed. Modern tool-making methods. 1915. Industrial press. $2.50

Less general than Markham and with more emphasis on tools for precision work and measurements.

Colvin, F. H. and **Stanley, F. A.** Toolmaker's kinks. 1908 McGraw .60

Holford, H. 20th century toolsmith and steelworker. 1912. Drake $1.50

This relates to forging operations and is not what is generally implied by toolmaking in connection with shop practice.

Tools and Devices for Quantity Production by Machine Tools

Woodworth, J. V. American tool making and interchangeable manufacturing. 2d ed. 1911. Henley $4.

A full and detailed book on the small tools, jigs, fixtures and special devices used in quantity production. Plainly written for the man in the shop.

Colvin, F. H. and **Haas, L. L.** Jigs and fixtures. 1913. McGraw $2.

Less full than Dowd or Woodworth but illustrates many typical examples from practice.

***Dowd, A. A.** Tools, chucks and fixtures. 1915. Industrial press $2.50

Comprehensive treatise on tools and devices for turning and boring operations.

Colvin, F. H. and **Stanley, F. A.** Jig and fixture kinks. 1908. McGraw .60

Dies and Die-making

***Shailor, F. E.** Tool and die design for beginners. 1917. Amer. technical soc. $1.

The section on tool design has special reference to dies.

Woodworth, J. V. Punches, dies and tools for manufacturing in presses. 1916. Henley $4.

Comprehensive and plainly written.

Colvin, F. H. Practical die-making. 1916. McGraw $2.

Includes a chapter on the application of press tools to clock work.

***Stanley, F. A.** Punches and dies; layout, construction and use. 1919. Industrial press. $4.

Nearly all the examples from practice have been gathered at first hand and not from periodicals. The best book on the subject.

Gages

Hamilton, D. T. Gages, gaging and inspection. 1918. Industrial press $2.50

A comprehensive treatise giving special attention to present practice in the application of the limit system to interchangeable manufacturing.

Machine Shop Equipment and Management

Perrigo, C. O. E. Modern machine shop construction, equipment and management. 2d ed. 1917. Henley $5.
A standard comprehensive work.

Clewell, C. E. Handbook of machine shop electricity. 1916. McGraw $3.
An excellent book covering the chief applications of electricity in the shop and giving helpful data on costs.

Shaw, T. R. Driving of machine tools. 1917. Van Nostrand $2.
An English book which includes examples from American practice.

Horner, J. G. Machine stops, trips and locking devices. 1913.
Machinery's reference series No. 112. Industrial press .75

Safeguards for machine tools and power presses. 1914. Industrial press .25
Machinery's reference series no. 140.

Jones, F. D. and **Hammond, E. K.** Shop management and systems; a treaties on the organization of machine building plants. 1918. Industrial press $2.50

Van Deventer, J. H. Handbook of machine shop management. 1915. McGraw $2.50

Wholly different from and supplementary to Jones and Hammond. Does not outline a general organization, but contains valuable information and data on details, under such headings as equipment control, time and cost control, etc.

***Van Deventer, J. H.** Success in the small shop. 2d ed. 1918. McGraw $1.75
For the owner and manager. Methods that make for economy and efficiency.

Van Deventer, J. H. Making the small shop profitable. 1918. McGraw $1.75
Supplements the previous entry. Less concerned with the broader problems, and deals more with special working methods and devices.

PATTERN MAKING

Turner, F. W. and **Town, D. G.** Pattern-making. 1914. Wiley $1.
A very brief outline of tools and processes, and the relation between foundry methods and practical pattern-making.

Purfield, H. T. Wood pattern making. New ed. 1916. Manual arts $1.50
A good book especially intended for use in manual training courses and technical schools. "Not arranged about a course of problems."

***Ritchey, J.** and **Monroe, W. W.** Pattern-making. 1916. Amer. technical soc. $1.50
Practical working methods described and illustrated. Includes a section on molding and the adaptation of pattern shop methods to molding-machine requirements.

Barrows, F. W. Practical pattern-making. 2d ed. 1913. Henley $2.

Plainly written for the average worker and covers the subject broadly.

International correspondence schools. [Pattern-making, etc.] (International library of technology, v. 141). 1915. International textbook co. $5.

This volume includes also green sand molding and core making.

Colvin, F. H. Pattern-making kinks. 1908. McGraw .60

MOLDING AND FOUNDRY PRACTICE

Tate, J. M. and **Stone, M. C.** Foundry practice. 3d ed. 1909. Wiley $1.80

"A text-book which correlates the work of the shop and the classroom."

Palmer, R. H. Foundry practice; a text book for molders, students and apprentices. 1912. Wiley $2.

More detailed on many points than Tate and Stone.

*Gray, B. L. Foundry work; a practical handbook on standard foundry practice, including hand and machine molding. 1916. Amer. technical soc. $1.

Concise treatment, more directly practical than the previous titles.

International correspondence schools. [Foundry practice]. International library of technology, v. 142). 1915. International textbook co. $5.

This volume covers machine molding, foundry chemistry, cupola practice and other topics except green sand molding and core making, which are contained in v. 141.

Moldenke, R. G. G. Principles of iron founding. 1917 McGraw $4.

Not on working methods, but a thorough and authoritative presentation of principles involved in the various operations. Important book.

Payne, D. W. Founder's manual. 1917. Van Nostrand $4.

Reference manual containing much valuable data on the characteristics of foundry irons and on other subjects related to foundry work.

Alexander, M. W. Safety in the foundry. 1915. National founders' assn., Chic. $1.50

Includes incidentally much information on equipment and layout of foundry plants.

FORGING

Schwartzkopf, E. Plain and ornamental forging. 1916. Wiley $1.50

A technical high school text which is adapted to self-instruction. It includes about 50 pages on art forging.

Googerty, T. F. Practical forging and art smithing. 1915. Bruce pub. co. $1.
A concise book which is particularly good on art smithing.

Crowe, C. P. Forgecraft. 1913. R. G. Adams & co., Columbus $2
Not a rounded text but a clear discussion of certain processes and operations. Good photographs illustrate proper position of hands and tools.

***Jernberg, J.** Forging manual of practical instruction in hand forging . . . drop forging and heat treatment of steel. 1917. Amer. technical soc. $1.
Emphasizes the importance of an understanding of heat treatment for various types of steel.

Sallows, J. F. Blacksmith's guide; valuable instructions on forging, welding, hardening, tempering, etc. 1907 Technical press. $1.50
Concise information by an experienced smith. Not illustrated.

Cathcart, W. H. Value of science in the smithy and forge. 2d ed. 1916. Lippincott $1.75
A practical study of metallography, heat treatment and the chemistry of welding as influencing intelligent work in forging.

Holford, H. 20th century toolsmith and steelworker. 1912. Drake $1.50

Casterlin, W. S. Steel working and tool dressing. 1914. M. T. Richardson co., N. Y. $2
Based on long experience and written for other workers in the field.

International correspondence schools. [Forging, etc.] (International library of technology, v. 140). 1915. International textbook co. $5.
Where machine forging is of special interest, this volume will be valuable on hammer work, machine forging, forging dies, and special forging operations.

Hamilton, D. T. Machine forging. 1914. Industrial press. .25
Machinery's reference series no. 114. Describes the use of the upsetting and forging machine in the forming and welding of machine parts.

Horseshoeing and General Smithing

***Holstrom, J. C.** Modern blacksmithing, rational horse-shoeing and wagon making. 1913. Drake $1.

U. S. Militia bureau. Manual for farriers, horseshoers, saddlers and wagoners or teamsters. (War dept. document no. 468). 1917. Supt. of doc.

Churchill, F. G. Practical and scientific horseshoeing. Hudson $1.
Emphasis is on a proper understanding of the anatomy and treatment of the horse's hoof rather than on working the metal.

Welding

(See also Electric Welding)

Manly, H. P. Oxy-acetylene welding and cutting, electric forge and thermit welding. 1916. Drake $1.
About two-thirds of the book is on the oxy-acetylene process.

***Hart, R. N.** Welding . . . . electric, thermit and hot-flame processes. 1914. McGraw $2.50
A good book covering the several types of welding in a more thorough and advanced manner than Manly.

***Campbell, L.** Oxy-acetylene welding manual. 1919. Wiley $1.25
Illustrated textbook by the officer in charge of welding instruction, Ordnance dept., U. S. A.

Willis, P. F. Practical manual of oxy-acetylene welding and cutting. 3d ed. 1919. Author, St. Louis .75
Introductory part is in question and answer form. Contains a good section on boiler welding.

Kehl, R. J. Oxy-acetylene welding practice. 1917. Amer. technical soc. $1.
Concise working manual with specific instructions. Contains a few pages on auto welding.

Kautny, T. Autogenous welding and cutting. 1915. McGraw $1.
Translation of a German book which gives a concise survey of oxy-acetylene welding processes and applications, with special attention to a clear understanding of principles.

***Miller, S. W.** Oxy-acetylene welding. 1916. Industrial press. $2.50
The most thorough treatise on the subject. A good chapter on welding aluminum.

Dunham, M. K. Automobile welding with the oxy-acetylene flame. 1916. Henley $1.

Brazing and Soldering

Hobart, J. F. Brazing and soldering. 5th ed. 1912. Henley .25
This paper covered booklet may be sufficient in a very small collection.

***Hobart, J. F.** Soft soldering, hard soldering and brazing. 1912. Van Nostrand $1.

Jones, B. E. Soldering, brazing and welding. 1917. Funk .75
An English book which on the whole does not duplicate Hobart. Includes a section on soldering jewelry as well as on welding which Hobart does not.

SHEET METAL WORK

(See also Boiler Making)

***Williams, H. V.** New tinsmith's helper and pattern book; a textbook and working guide. 1917. U. P. C. book co. $2.
Contains useful tables and practical working instructions as well as some general layout problems and typical applications.

Neubecker, W. Sheet-metal work; a manual of practical self-instruction in the art of pattern drafting and construction work in light- and heavy-gauge metal. 2d ed. 1917. Amer. technical soc. $2
Applications are largely to sky-light, roofing and cornice work.

***Broemel, L.** Sheet metal workers' manual. 1918. Drake $2.
This is the most complete book on the tools, machinery and working methods of the trade. Includes a section of 150 pages on elementary sheet metal work by J. S. Daugherty, which is also published as a separate book entitled Essentials of sheet metal work.

Kidder, F. S. Triangulation applied to sheet metal pattern cutting . . . for cutters, draftsmen, foremen and students. 1917. U. P. C. book co. $2.50
Thorough treatment of a method especially adapted to irregular patterns.

Kittredge, G. W. New metal-worker pattern book. 1917. U. P. C. book co. $6
Large volume with a comprehensive series of problems illustrating commercial work solved in detail.

Metal Worker, plumber and steam fitter. Practical sheet metal work and demonstrated problems. 12v. 1910-12. U. P. C. book co. $15 per set or $1.50 ea.
Valuable series for the experienced worker. Most of the volumes relate to work on buildings (cornices, leaders, etc.) but vol. 11 is on the automobile and sheet metal boats. For subjects by volume see U. P. C. book co. catalogue.

Neubecker, W. Practical sheet metal duct construction. 1916. U. P. C. book co. $2.
For heating and ventilating equipment.

Neubecker, W. Kinks and labor saving methods for sheet metal workers. 2v. 1918. Sheet metal pub. co. ea. $1.
Useful short cuts and special devices.

STEAM ENGINEERING

(See also Marine Engineering)

Thermodynamics

Randall, J. A. Heat; a manual for technical and industrial students. 1913. Wiley $1.50.
A textbook with many practical problems which involve only simple algebra in most cases.

***Shealy, E. M.** Heat; prepared in the Extension division of the University of Wisconsin. 1914. McGraw $2.
Clear general outline of the nature and laws of heat and brief survey of their application to the steam engine, etc. Better than Randall for men with some practical experience. There are companion volumes on boilers and engines.

Goodenough, G. A. Principles of thermodynamics. 1911. Holt $3.50.
A standard textbook of college grade.

Greene, A. M. Heat engineering; a textbook of applied thermodynamics for engineers and students in technical schools. 1915. McGraw $4.

Presupposes a course in elementary thermodynamics. Excellent book for advanced students.

Systematic Texts

Hirshfeld, C. F. and **Ulbricht, T. C.** Steam Power. 1916. Wiley $2.

A sound elementary book intended to give the stationary engineer an adequate understanding of the principles governing the operation of engines and other steam apparatus.

***Allen, J. R.** and **Bursley, J. A.** Heat engines. 2d ed. 1914. McGraw $3.

Excellent short course in steam engineering, avoiding detailed theory and unnecessary mathematics. Includes also gas engines.

Ripper, W. Heat engines (being a new edition of "Steam"). 1913. Longmans $1.10.

Well known English elementary text, written more particularly for men with some practical experience. The book now includes steam turbines and gas engines.

***Gebhardt, G. F.** Steam power plant engineering. 5th ed. 1917. Wiley $4.

One of the best books on steam engineering, giving an exhaustive treatment for the engineer or advanced student.

Stationary Engineering

***Hiscox, G. D.** Modern steam engineering in theory and practice. 4th ed. 1919. Henley $3.

Comprehensive illustrated work descriptive of general practice and standard apparatus, for the stationary engineer. Includes sections on refrigeration, elevator and electricity. Reprint of the 3d edition, 1913. A book that is much used in a library collection.

Branch, J. G. Stationary engineering. 3 v. 1908. Branch $10.

Written in plain and practical style for the man in charge of a steam plant. The work is of a type that is in demand but there has been no real revision since 1908, though a fourth edition is listed.

Crane, W. E. American stationary engineering. 3d ed. 1917. Henley $2.

Not a rounded treatment but miscellaneous information and advice from experience.

Manuals for the Operating Engineer

Booth, C. E. Audel's answers on practical engineering, for engineers, firemen, machinists, etc. 1912. Audel $1.

Swingle, C. F. Complete examination questions and answers for marine and stationary engineers. Drake $1.50

Differs from 1914 edition by inclusion of a section on oil engines. Most of the book remains the same as the 1906 edition.

*Swingle, C. F. Twentieth century handbook for steam engineers and electricians. 1916. Drake $3.
Comprehensive manual, one-third devoted to electricity. Covers briefly also gas engines, compressed air, refrigeration, elevators.

*Hamkens, H. Steam engine troubles; a practical treatise for the engineer, telling how to locate and remedy troubles with a steam engine. 1919. Henley $2.50.
Explains the construction and working of engine parts—such as valves, pistons, bearings, etc., points out the good and faulty features of various types and shows from what cause trouble may develop.

International correspondence schools. Steam engineer's handbook. 1913. International textbook co. $1.25.
More a reference handbook of data and less a manual of working instructions than the books listed above.

Colvin, F. H. and Cheney, W. L. Engineer's arithmetic. 3d ed. 1914. Henley .50.

The Steam Engine

*Shealy, E. M. Steam engines; prepared in the Extension division of the University of Wisconsin. 1919. McGraw $2.50.
Thorough non-mathematical text.

Ludy, L. V. Steam engines. 1917. Amer. technical soc. $1.
Discusses various types and treats of installation and operation, touching but lightly on underlying principles.

Benjamin, C. H. Steam engine. 1909. Technical press $3.
Textbook giving a much more concise and elementary treatment than Heck.

*Heck, R. C. H. Steam engine and turbine. 1911. Van Nostrand $3.50
One of the best texts for advanced students.

Pratt, H. K. Manual of the high speed steam engine. 1915. Van Nostrand $2.
General treatise on the design and operation of this type. English book.

Steam Engine Details

James, W. H. and Dole, M. W. Mechanism of the steam engine. 1914. Wiley $2.
Gives special attention to valves and governing devices.
Information on engine details is also contained in Hamkens' listed above under Manuals for the operating engineer.

Furman, F. D. R. Valves and valve gears, v. 1: steam engines and steam turbines. 2d ed. 1915. Wiley $2.50
Excellent detailed study of their mechanism and working. The second volume relates to gas engines.

Collins, H. E. Valve setting. 1908. McGraw $2.
General discussion with practical applications to standard (1908) types of engines.

Collins, H. E. Shaft governors. 1908. McGraw $1.
Characteristics of various types, and methods of adjusting.

Steam Engine Indicator

***Hawkins, N.** Practical treatise on the steam engine indicator. 1907. Audel $1.
This is still probably the most useful manual for ordinary purposes.

Low, F. R. Steam engine indicator. 3d ed. 1910. McGraw $1.50.
Based on articles written for Power.

Boilers

Collins, H. E. Boilers. 1908. McGraw $1.
Elementary book on the mechanical structure and practical operation of steam boilers.

Kuss, R. H. Steam boilers—design and construction, and the development of modern types. 1917. Amer. technical soc. $1.
Brief practical outline.

***Shealy, E. M.** Steam boilers; prepared in the Extension division of the University of Wisconsin. 1912. McGraw $2.50.
General non-mathematical text, especially good on combustion.

Kent, W. Steam-boiler economy. 2d ed. 1915. Wiley $4.50.
A standard treatise on efficient practice in boiler operation.

Parsons, H. deB. Steam boilers, their theory and design. 5th ed. 1917. Longmans $4.

Babcock & Wilcox co. Steam, its generation and use. 35th ed. 1913. Author, N. Y.
Valuable trade publication of over 300 pages. Written with special reference to water tube boilers, but contains much general information and data.

Kneass, S. L. Theory and practice of the injector. 3d ed. 1910. Wiley $1.50

Feed water appliances. 1911. Industrial press .25

Boiler water treatment. (U. S. Mines. Technical paper 218). 1919. Supt. of doc. .05

Handbooks

Swingle, C. F. Steam boilers, their construction, care and operation; with questions and answers. 1917. Drake $1.50.

Mason, C. J. Arithmetic of the steam boiler. 1914. McGraw $1.

Boiler Making

Boiler maker. Layout for boiler makers and sheet metal workers. 2d ed. 1913. Aldrich pub. co. $5.
A large volume with diagrams and technical details for the practical boiler maker.

Jeter, S. F. Riveted boiler joints. 1917. McGraw $3.
On design and causes of failure, with charts for graphical solution.

Kleinhans, F. B. Locomotive boiler construction. 2d ed. 1913. Henley $3.

Boiler Furnaces and Combustion

Barr, W. M. Combustion of coal and the prevention of smoke. 1913. Henley $1.
Elementary information in question and answer form. Reissue of 1900 edition.

Peebles, J. C. Furnace efficiency, combustion and flue gases. 1914. Branch $2.
Plainly written for the operating engineer.

Hays, J. W. Combustion and smokeless furnaces. 2d ed 1915. Simonds & co., Chic. $2.
More general discussion with less specific application to boiler room practice than the other titles listed. Same as 1906 edition except for addition of an appendix on testing apparatus.

*__Maujer, A. R.__ and __Bromley, C. H.__ Fuel economy in boiler rooms. 2d ed. 1918. McGraw $2.50.
Very practical and useful book, partly based on an engineers' study course that appeared in Power.

Randall, D. T. and **Weeks, H. W.** Smokeless combustion of coal in boiler furnaces, with a chapter on central heating plants. (U. S. Mines. Bul. 40). 1918. Supt. of doc. .20
A rather technical bulletin of nearly 200 pages.

Fuel

*__Cosgrove, J. F.__ Coal, its economical and smokeless combustion. 1916. Technical book pub. co., Germantown, Pa. $3.
Written to give a knowledge of the different types of coal and an understanding of the methods of combustion adapted to their varying characteristics.

Somermeier, E. E. Coal; its composition, analysis, utilization and valuation. 1912. McGraw $2
More technical than Cosgrove.

Poole, H. Calorific power of fuels. 3d ed., rewritten by R. T. Kent. 1918. Wiley $3.
An important book which includes much valuable data in tabulated form.

Strohm, R. T. Oil fuel for steam boilers. 1914. McGraw $1.
Plainly written book on the use of oil for firing steam boilers.

*Wadsworth, J. M. Efficiency in the use of oil fuel; a handbook for boiler-plant and locomotive engineers. 1918. Supt. of doc. .15.
A small bulletin of the U. S. Bureau of mines, apparently unnumbered.

Sibley, R. and Delany, C. H. Elements of fuel oil and steam engineering; a practical treatise dealing with fuel oil for the central station man, the power plant operator, etc. 1918
Technical pub. co. $3.
The most complete on the subject.

Steam Power Plants

(See also Testing; Engine Room Chemistry)

Meyer, H. C. Steam power plants, their design and construction. 3d ed. 1912. McGraw $2.
A standard concise work on the layout of power plants, the selection and proper location of the equipment, etc.

Fernald, R. H. and Orrok, G. A. Engineering of power plants. 1916. McGraw $4.
Important book of broader scope than Meyer, with strong emphasis on practical commercial considerations affecting the task of the engineer.

*Gebhardt, G. F. Steam power plant engineering. 5th ed. 1917. Wiley $4.
One of the best books on steam engineering, giving an exhaustive treatment for the engineer or advanced student.

Hubbard, C. L. Steam power plants. 2d ed. McGraw $2.50.
Covers power plants for factories, office buildings, etc., but not central stations.

Harding, L. A. and Willard, A. C. Power plants and refrigeration. 1917. Wiley $5.
This is the second volume of their Mechanical equipment of buildings, an important recent work on design and installation.

Myers, D. M. Preventing losses in factory power plants. 1915. Industrial management $3.
Practical book for managers of large industrial plants.

Steam Turbines

Leland, W. S. Steam turbines; a practical work on the development, advantages and disadvantages of the steam turbine. 3d ed. 1917. Amer. technical soc. $1.

*Moyer, J. A. Steam turbines; a practical and theoretical treatise for engineers and students. 3d ed. 1917. Wiley $3.50.
Good general treatise. (New edition is said to be in preparation.)

Goudie, W. J. Steam turbines; a textbook for engineering students. 1917. Longmans $4.
The first part of the book describes and illustrates many examples land and marine turbines.

Meyers, G. J. Steam turbines; a treatise covering U. S. naval practice. 1917. U. S. Naval institute $4.50.
An advanced treatise. Includes many diagrams and folding plates.

Steam Traction Engineering

***Stephenson, J. H.** Farm engines and how to run them. 1918. Drake $1.
Elementary instructions, with questions and answers. Gas engines are included.

Eighinger, S. R. and **Hutton, M. S.** Steam traction engineering. 1916. Appleton $2.50.
Much more thorough and complete than Stephenson on the steam traction engine.

PUMPING MACHINERY

(See also entries under Hydraulic Engineering)

Wakeman, W. H. Questions and answers on pumps and pumping machinery. 1912. Branch $2.

***Collins, H. E.** Pumps, troubles and remedies. 1908. McGraw $1.
Good working manual.

Nickel, P. F. Direct-acting steam pumps. 1915. McGraw $3.
Thorough general treatise on design and construction. Not of much help to the operating engineer.

Greene, A. M. Pumping machinery. New ed. 1919. Wiley $4.
A full text for advanced students, broader in scope than Nickel. Includes an important introductory section on history and development and a detailed study of centrifugal pumps.

MARINE ENGINEERING

(See also Gas and Oil Engines; Steam Turbines)

Ware, B. R. Handy book for the aid and instruction of the enlisted men in the engineering department, U. S. navy. 1918. U. S . Naval institute .50
Concise summary of practical information on the engineering equipment of vessels.

***Durand, W. F.** Practical marine engineering for marine engineers and students, with aids for applicants for marine engineers' licenses. 4th ed., revised by Capt. C. W. Dyson. 1917. Marine engineering, N. Y. $6
A standard general work. Last edition sometimes listed with Dyson au author. Lucas, below, is better adapted to the marine engineer without a technical education.

Barton, J. K. and **Stickney, H. O.** Naval reciprocating engines and auxiliary machinery. 3d ed. 1914. U. S. Naval institute $4.90
Non-mathematical detailed treatment. This and the following title are probably the best American books in their field.

Lyon, F. and **Hinds, A. W.** Marine and naval boilers. 1915. U. S. Naval institute $3.25.

Manuals for the Operating Engineer

Brennan, J. T. and **Spires, J.** Liberty advisor for marine engineers. 1918. Beacon press, N. Y. $1.50
Simple authoritative book of questions and answers.

***Lucas, T.** and **others.** Audel's new marine engineers guide. 1918. Audel $3.
Comprehensive manual for the operating engineer, including auxiliary machinery and regulations for licenses. Probably the most useful book for a small collection.

Swingle, C. F. Complete examination questions and answers for marine and stationary engineers. 1917. Drake $1.50
Differs from 1914 edition by inclusion of a section on oil engines. Most of the book is same as 1906 edition.

***Dinger, H. C.** Handbook for the care and operation of naval machinery. 2d ed. 1918. Van Nostrand $3.
Supplementary to general works on marine engineering. Very practical details on care and overhauling of steam engines and auxiliary equipment except electrical.

Reed's useful hints to sea-going engineers and how to repair and avoid "breakdowns." 6th ed. 1917. Van Nostrand $3.
Well known English manual. Sothern's "Verbal" notes for marine engineers is another widely used English book, more comprehensive than Reed's Useful hints. Too costly for a small collection.

Manuals for Other Naval Artisans

Bullard, W. H. J. Naval electricians' text book. 4th ed. 2v. 1917. U. S. Naval institute. ea. $3.75
The second volume is a practical book on the electrical equipment of ships and contains material not easily found elsewhere. The first volume, on electrical principles is not so important for library use.

Pate, M. Naval artificer's manual. 1918. U. S. Naval institute $2.
Official handbook with technical instructions on the work of carpenters' mates and shipwrights, ship fitters, plumbers, blacksmiths and painters.

GAS AND OIL ENGINES

(See also Automobiles; Aviation Engines)

***Verrill, A. H.** Harper's gasoline engine book. 1914. Harper $1.
Written for the amateur and user of small engines, but contains considerable detail in non-technical language and many illustrations. Good, practical introductory book.

Kushlan, M. Gas motor. 2d ed. 1919. Branch $3.
Plainly written book without details of theory or of individual engine types. One-half on general features of a gas engine, and the other on its application to stationary, automobile and aviation work.

Hirshfeld, C. F. and **Ulbricht, T. C.** Gas power. 1913. Wiley $1.25
Sound elementary book treating the subject broadly and concisely and not limited to the mechanism of the gas engine alone.

Poole, C. P. Gas engine. 2d ed. 1910. McGraw $1.
Reliable concise work on essential features.

***Hiscox, G. D.** Gas, gasoline and oil engines; a complete practical work . . . revised by V. W. Pagé. 22d ed. 1917. Henley $2.50
Comprehensive, fully illustrated book giving a non-mathematical descriptive treatment.

Sterling, F. W. Internal combustion engine manual. 4th ed. 1917. U. S. Naval institute $1.75
A non-mathematical descriptive text used at the Naval academy. Not limited to naval types of engines, and includes sections on aerial motors and on the Diesel engine. Reliable book, useful in a library collection.

***Roberts, E. W.** Gas engine handbook; a manual of useful information for the designer and the engineer. 9th ed. 1917. Gas engine pub. co., Cincinnati $2.
Material is well selected from the practical standpoint and clearly presented. Covers description, design and operation, testing, selection. Not a data handbook but a general treatment.

Marks, L. S. and **McDewell, H. S.** Gas and oil engines and gas-producers. 1916. Amer. technical soc. $2.
A reliable treatise of a more advanced type than most of the books issued by this publisher. Covers principles and details of construction, but has little on operation.

Streeter, R. L. Internal combustion engines, theory and design; a textbook . . . for engineers and students in engineering. 1915. McGraw $4.

Operation of Gas Engines

(Note: Volumes 93 and 94 of the International library of technology are on gas engines and constitute one of the best works on practical aspects. Volume 94 contains the section on management and repair.)

***U. S. Coast guard.** Handbook on care and operation of gasoline engines. 1917. Supt. of doc. .10
Concise manual primarily for men of little mechanical training. Includes definitions of terms, brief information on the structure and working of the gas engine, and specific directions for care and operation.

Verrill, A. H. Gasoline engines, their operation, use and care. 1912. Henley $1.50

Rathbun, J. B. Gas engine troubles and installation; with notes on the repair, installation and operation of Diesel, semi-Diesel and hot bulb oil engines. 4th ed. 1919. Stanton $1.
A manual arranged for reference use by the operating engineer. A classified "trouble chart" of several pages takes the place of an index and gives reference to the pages where causes and remedies are explained.

Gas Engine Details

Furman, F. de R. Valves and valve gears, v. 2; gasoline, gas and oil engines. 1915. Wiley $2.
Treats of valve mechanism rather than design of parts for proper strength. The other volume of this work relates to steam engines.

***Norris, E. B. and others.** Gas engine ignition. 1916. McGraw $1.50
Excellent book, clearly written and well adapted to home study. More general than Toepel, and relates chiefly to stationary and automobile engines.

Toepel, M. E. Automotive magneto ignition . . . with special reference to aviation engines. 1918. Spon. $2.
Plainly written concise treatment in question and answer form, by a Government instructor.

Pagé, V. W. Gasoline and kerosene carburetors; construction, installation, adjustment; a simple comprehensive treatise for practical men. 1919. Henley $1.50

Browne, A. B. Handbook of carburetion. 1915. Wiley $2.
Of value to the designer and automobile engineer. Not for the owner or chauffeur.

Liquid Fuel

***Burrell, C. A.** Gasoline and how to use it. 1916.
Oil statistical soc., Boston $1.50
A general handbook of information on gasoline, its use and how to get full power from it, precautions, etc., by a former Government expert.

Moore, H. Liquid fuel for internal combustion engines. 1918.
Van Nostrand $5.
Comprehensive book on the different fuels and their applicability to various types of engines. Includes chapters on carburetors, etc., and on examination of liquid fuels.

Gas Engines on the Farm

***Yerkes, A. P.** Practical hints on running a gas engine (Farmers' bulletin 1013). 1919. Supt. of doc. .05

***Hirshfeld, C. F.** and **Ulbricht, T. C.** Farm gas engines. 1913.
Wiley $1.50
A reliable guide to intelligent purchase. Explains general principles, the features that adapt an engine to various uses and efficient service, etc. Not an operating handbook.

Putnam, X. W. Gasoline engine on the farm. 1913. Henley $2.50
This book deals chiefly with use and repair and does not duplicate Hirshfeld.

Potter, A. A. Farm motors. 2d ed. 1917. McGraw $1.50
Describes many types of power generators, including water motors and windmills, but gives little information on their application to farm work.

Gas Tractors

(Note: There is no book that treats adequately the many types now manufactured and their applications in farming. Trade publications will help to meet the demand.)

Stephenson, J. H. Traction farming and traction engineering . . . a practical handbook for the owners and operators of gas and oil engines on the farm. 1917. Drake $1.50
Not so full on mechanical details or so well illustrated as Pagé, but has a section in which each of about ten leading types are described.

***Pagé, V. W.** Modern gas tractor, its construction, utility, operation and repair. 2d ed. 1917. Henley $2.
Like his automobile books gives full and clear treatment on all mechanical features, with many good diagrams and illustrations.

***Zimmerman, O. B.** Internal combustion engines and tractors. 1918. International harvester co., Chic. gratis.
Trade publication by a competent authority. Contains general information on the subject in addition to details concerning the type of tractor produced by this company.

Farm implement news. Tractor field book. 1918. Farm implement news, Chic. .25
Contains sufficient technical information to be useful to libraries.

Diesel Engines

***Haas, H.** Diesel engine, its fuels and its uses. (U. S. Mines. Bul. 156). 1918. Supt. of doc. .25
Illustrated pamphlet of 133 pages which gives perhaps the best survey of the subject for an introductory study.

Chalkley, A. P. Diesel engines for land and marine work. 4th ed. 1916. Van Nostrand. $4.
Comprehensive, non-mathematical and fully illustrated, including folding plates. Important book.

Supino, G. Land and marine Diesel engines. 1915. Lippincott. $4.50
Translation of a standard Italian work which deals very fully with mechanical features as well as general principles. Many folding plates and illustrations.

AUTOMOBILES

Brokaw, H. C. and **Starr, C. A.** Putnam's automobile handbook; the care and management of the modern motor car. 1918. Putnam. $1.90
For the owner and inexperienced chauffeur. Less attention to mechanical features than Pagé.

***Pagé, V. W.** How to run an automobile; a concise practical treatise written in simple language. 1917. Henley. $1.
Reliable guide with adequate description and illustration of mechanical details for intelligent car operation.

Pagé, V. W. Questions and answers relating to modern automobile design, construction, driving and repairing. 1918. Henley $1.50

***Pratt, C. H.** Pratt's automobile instructor . . . a home study course and reference work for amateur and expert. New ed. 1917. Shrewesbury pub. co. $1.50

Hobbs, G. W. and **Elliott, B. G.** Gasoline automobile; prepared in the Extension division of the University of Wisconsin. 1915. McGraw. $2.

A concise treatment emphasizing essential features of construction and operation.

Russell, T. H. and **Rathbun, J. B.** Motor truck and automobile motors and mechanism. 1917. Stanton. $1.

One of the few books that gives special attention to the truck as distinguished from the pleasure car.

Pagé, V. W. Modern gasoline automobile; its design, construction operation and maintenance. 1917. Henley. $3.

A very comprehensive and clearly written treatise. Lacks the exhaustive detail of Dyke, but it is better adapted to continuous reading.

Hall, M. A. Automobile construction and repair, a practical guide to the design, construction and repair of automobile mechanism. 1918. Amer. technical soc. $2.50.

***Dyke, A. L.** Dyke's automobile and gasoline engine encyclopedia. 9th ed. 1919. Author, St. Louis $4.

The most complete and important book on the mechanical details of the automobile, including operation and repair. There are supplements on airplanes and the liberty motor. The arrangement of contents is not alphabetical (but well indexed) and the book is not essentially a reference volume. In constant demand.

Heldt, P. M. Gasoline automobile; its design and construction. 3v. 1918. Author, Nyack, N. Y. $13.50

v. 1 Motor. 5th ed.	$5.00
v. 2 Transmission, etc. 3d ed.	5.00
v. 3 Electric equipment. 1st ed.	3.50

Volumes 1 and 2 are valuable to the designer and the automobile engineer, but not intended for the owner or auto mechanic. Volume 3 is based on material originally written for repair men and retains much of the original viewpoint, and has a wider appeal than the other volumes.

Favary, E. Motor vehicle engineering: engines (for automobiles, trucks, and tractors). 1919. McGraw $3.

For the designer and draftsman of automobile engines. Avoids higher mathematics but gives information from the best practice, with many diagrams. Especially important for its full attention to truck engine design.

Automobile Bodies

Terry, C. W. Motor body building in all its branches. 1914. Spon $3.

English book for which there seems to be no nearer American equivalent than the following title:

Metal worker, plumber and steam fitter. Automobiles and sheet metal boats. U. P. C. book co. $1.50
One a series of volumes on practical sheet metal work.

Electrical Equipment

Manly, H. P. Automobile starting and lighting; a non-technical explanation. 1918. Drake $1.

Pagé, V. W. Modern starting, lighting and ignition systems. 1918. Henley $1.50
Well illustrated general explanation and description.

Moreton, D. P. and **Hatch, D. S.** Electrical equipment of the motor car. 1918. U. P. C. book co. $2.50
Written for men with little knowledge of electricity. Treats the general subject in detail but does not cover the special modifications used in cars of various makes.

***Hayward, C. B.** Automobile ignition, starting and lighting, a comprehensive analysis of the complete electrical equipment of the modern automobile, including many wiring diagrams . . . . 2d ed. 1918. Amer. technical soc. $2.50
Detailed and well provided with diagrams. Questions and answers follow certain sections.
Note: See annotation under Heldt's Gasoline automobile.

Tires

Cayard, L. H. Automobile tire handbook; not a scientific treatise but a handbook for the use of the car owner and automobile operator. 1917. Author, N. Y. $1.50

Ford Automobile

***Pagé, V. W.** Model T Ford car, truck and conversion sets. Rev. ed. 1918. Henley $1.
Covers mechanical features, operation and repair. The chapter on conversion sets includes a description of the genuine Ford tractor. Better illustrated than Manly and preferable for a single purchase.

Manly, H. P. Ford motor car, and truck and tractor attachments, their construction, care and operation. 1917. Drake $1.

Electric Automobiles

Cushing, H. C. jr. and **Smith, F. W.** Electric vehicle handbook. 5th ed. 1916. Author, N. Y. $2.

Motorcycles

Jackman, W. J. A B C of the motorcycle. 1916. Stanton $1.
For the owner with little mechanical knowledge. A few added diagrams and slight changes from earlier editions.

*Pagé, V. W. Motorcycles, side-cars and cycle cars. 1917. Henley $1.50.

The most complete book.

Care and repair of motorcycles. 6th ed. 1915. Bicycling world co., N. Y. .25

Automobile Repairing

Pagé, V. W. Automobile repairing made easy. 1917. Henley $3.

Full explanations covering all parts of a car. Abundantly illustrated.

Smoyer, M. E. Auto repairing simplified. 4th ed. 1918. Tierman-Dart printing co., Kansas City $3.

In form of a series of instruction papers, followed by brief questions and answers. Purpose of the book is to explain in detail the structure and working of the parts as a basis for intelligent repair work.

*Williams, S. T. Automobile repairman's helper. 1918. U. P. C. book co. $2.50.

About one-half the book contains well illustrated instructions on general repairs, the rest covers special applications to work on leading makes of cars.

Motor World. Automobile repair shop short-cuts; over 1500 time and labor saving devices . . . 4th ed. 1918. U. P. C. book co. $2.50.

Dunham, M. K. Automobile welding with the oxy-acetylene flame. 1916. Henley $1.

Tufford, H. H. Tire repairing and vulcanizing. 1918. William Hood Dunwoody industrial institute $1.75

Vanderwalker, F. N. Automobile painting and carriage and wagon painting. 1917. Drake $1.50.

Valentine & co. Motor-car paint-shop handbook. 1917. Author, N. Y. $1.

Trade publication, less comprehensive than Vanderwalker, but directly to the point and found to be very useful.

AVIATION

(Note: This is purposely a restricted list including chiefly recent books serviceable to the airplane mechanic and the aviator. The subject has been so much before the public and the literature is so recent that most libraries are undoubtedly well provided, in proportion to local needs and funds, with the older and more popular books.)

Aeroplanes

*Pagé, V. W. A B C of aviation . . . a simplified text suitable for school or home study. 1918. Henley $2.50.

A very complete plainly written book on aeroplanes, describing and illustrating their structure in detail. Good sections on assembling and inspecting.

Rathbun, J. B. Aeroplane construction and operation. Stanton $2.
Aims to give "that part of the theory and description that will be of practical use for the builder and flyer." One of the best books intermediate between popular description and mathematical design.

Loening, G. C. Military aeroplanes. 1918. Military pub. co. $4.75
A standard book, with important information on construction, assembling and management.

Klemin, A. Aeronautical engineering and airplane design. 1918. Gardner-Moffat co. $5.
A systematic and comprehensive book treating the subject as simply as is compatible with actual design for commercial results. Authoritative.

King, J. T. Aeroplane construction and assembling. 1918. William Hood Dunwoody industrial institute. $1.50

***Colvin, F. H.** Aircraft mechanics handbook; a collection of facts from factory and flying field to assist in caring for modern aircraft. 1918. McGraw $3.
Good book on the inspection, repair and adjustment of aeroplane parts and accessories.

Aviation Engines

***Chadwick, J. C.** Aviation engines. 1919. E. N. Appleton .75
Non-mathematical book for the prospective aeroplane pilot. Includes descriptions of the liberty engine, the Hispano-Suiza and the Curtiss. Authorized by the Secretary of the Navy.

Pagé, V. W. Aviation engines; design, construction, operation and repair. 1917. Henley $3.
Detailed, comparatively non-technical book, as full as military censorship permitted at the time.

Le Cain, J. Care and operation of aero motors for army and navy aviators and mechanics. 1918. Aero-motors pub. co. $1.
Booklet of about 50 pages giving concise practical directions. Inconveniently small for library shelves.

Toepel, M. E. Automotive magneto ignition; its principle and application with special reference to aviation engines. 1918. Spon $2.
Clearly written, concise treatment in question and answer form, by a Government instructor.

Practical Flying

Fales, E. N. Learning to fly in the U. S. army, a manual of aviation practice. 1917. McGraw $1.50.
Written to meet conditions of hurried training, it omits non-essentials.

McMinnies, W. G. Practical flying. 1918. Doran $1.50.
English, but is one of the clearest and fullest available on instructions for flying.

*White, J. A. Practical aviation for military airmen. 1918. Wireless press $1.75.

A concise text book with exact explanations and instructions. The matter is so presented as to emphasize each point for study, and the book is not well adapted to continuous reading. Important in its field.

Barber, H. Aerobatics. 1918. McBride $3.

Seeks to teach the novice in flying how to learn in the shortest possible time the skillful manoevering of his plane in the air.

Benson, C. B. Map reading for aviators, with a chapter on aerial navigation. 1918. Author, Ithaca, N. Y. .75.

ELECTRIC ENGINEERING

GENERAL BOOKS

Branch, J. G. Questions and answers on practical electricity. 1914.
Reissue of his Conversations on electricity. Branch $2.

***Timbie, W. H.** Essentials of electricity; a textbook for wiremen and the electrical trades: direct currents. 1913. Wiley $1.25.
To give a working understanding to those who do not look forward to advanced study.

Hawkins, N. and **others.** Hawkins electrical guide; questions, answers and illustrations . . . for those desiring to acquire a working knowledge of electricity and its applications. 10v. 1917.
Audel. ea. $1.
Elementary, reliable and very popular series of which volumes are sold separately.

v. 1 Covers electricity and magnetism and principles of the dynamo.
v. 2 Management of dynamos and motors, instruments.
v. 3 Wiring and distributing systems, storage batteries.
v. 4-7 Alternating currents and applications.
v. 8-10 Telegraph, railways and miscellaneous applications, and a full index.

Millikan, R. A. and **Bishop, E. S.** Elements of electricity. 1917.
Amer. technical soc. $1.50.
A plainly written but systemati summary of electrical principles.

***Croft, T. W.** Practical electricity. McGraw $2.50
Good clear book on the principles and chief applications of electricity, involving only arithmetic. One of the most useful books on the subject for a library.

***Swoope, C. W.** Lessons in practical electricity. 15th ed. 1919.
Van Nostrand $2.
Well known elementary text. Compared with Timbie's "Elements," gives more space to general electricity and less to the various applications. Reissue of 1913 edition.

Timbie, W. H. Elements of electricity for technical students. 1910.
Wiley $2.
One of the best textbooks for technical school students.

***Jackson, D. C.** and **J. P.** Elementary book on electricity and magnetism and their applications; revised and enlarged by H. N. Black. 1919. Macmillan. $1.90.
Comprehensive illustrated text which, on account of its "descriptive statements" of principles and applications and its many good illustrations, is especially well suited to a general library collection.

Rowland, A. J. Applied electricity for practical men. 1916.
McGraw $2.
A text for trade schools and evening classes, requiring only simple algebra.

*Gray, A. Principles and practice of electrical engineering. 2d ed. 1917. McGraw $3.
Excellent book especially adapted to students and engineers who need a thorough general understanding, but whose special work lies in other branches of engineering.

Steinmetz, C. P. General lectures on electrical engineering. 5th ed. 1918. McGraw. $2.50.
Broad discussions of certain important topics. The treatment is not difficult but a general knowledge of electricity and its applications is assumed. Most of this author's other works are highly mathematical.

Christie, C. V. Electrical engineering; the theory and characteristics of electrical circuits and machinery. 2d ed. 1917. McGraw $4.
One of the best college texts for advanced students.

Steinmetz, C. P. Theoretical elements of electrical engineering. 4th ed. 1915. McGraw $3.
A work of the highest atuhority, of value to supplement college texts.

Dictionary

Hawkins, N. Hawkins' electrical dictionary; a cyclopedia of words, terms, phrases and data. 1915. Audel $2.
A satisfactory inexpensive dictionary that includes brief encyclopedic matter wtih most of the definitions. **Hobart's Dictionary of electrical engineering** (1911) is a standard work in two volumes that most libraries will not care to purchase at this date.

Handbooks

*Croft, T. W. American electrician's handbook. 1913. McGraw. $3.
A reference manual for the practical man rather than the technically trained engineer. Well suited to its purpose and reliable, and sufficient for a small collection. **Foster's Electrical engineer's pocketbook** (7th ed., 1913) is found very useful with the same type of borrower in some libraries, but Croft and either Pender or the Standard will be sufficient for many collections.

Pender, H., ed. American handbook for electrical engineers. 1014. Wiley $5.

Standard handbook for electrical engineers, edited by F. A. Fowle. 4th ed. 1915. McGraw $5.
These two books are of very similar scope and merit, and many experts have contributed to each. The contents of **Pender** are arranged alphabetically with cross references, while in the **Standard** they are grouped by subject but adequately indexed. There is little reason to recommend the purchase of one in preference to the other for libraris, but recent demand seems to favor **Pender.**

Horstmann, H. C. and Tousley, V. H. Modern electrical construction .... showing the latest approved methods of installing work of all kinds according to the safety rules of the National board of fire underwriters. 5th ed. 1916. Drake $1.

Examinations

Branch, J. G. One thousand questions and answers for engineers, applicants for license and electricians. 1912. Branch $2.
About three-fourths of the book is devoted to electricity.

*Thackaberry, S. J. Aids to electrician's examinations. 1917. Baron de Hirsch trade school. $1.
To cover preparation for license as electrician. Probably more serviceable than Branch.

SAFETY PRECAUTIONS AND APPARATUS

U. S. Bureau of standards. Safety rules to be observed in the operation of electrical equipment and lines. 2d ed. 1915. Supt. of doc. .10

Peebles, J. C. Electric safety devices. 1913. Branch $1.
Elementary manual on fuses, circuit breakers, lightning arresters, etc.

ELECTRIC MACHINERY

*Croft T. W. Electrical machinery; principles, operation and management. 1917. McGraw $2.
An excellent non-mathematical book on principles and practice.

Morecroft, J. W. Continuous and alternating current machinery. 1914. Wiley $1.75
A textbook for technical schools.

Bailey, B. F. S. Principles of dynamo electric machinery. 1915. McGraw $3.
More advanced treatment than Morecroft but non-mathematical, seeking especially to "present a clear physical conception of the phenomena which take place in electrical machinery."

Management of Electrical Machinery

(Note: See also Croft's Electrical machinery, above, which is one of the best practical books.)

Care and repair of dynamos and motors. 1909. Industrial press .25
Machinery's reference series no. 34.

Hawkins, N. Hawkins electrical guide, v. 2. 1917. Audel $1.
This volume treats, in question and answer form, the management of dynamos and motors and the use of testing instruments.

*Horstmann, H. C. and Tousley, V. H. Electricians' operating and testing manual. 1916. Drake $1.
Plainly written book on the essential principles of electrical machinery and the management and testing of the common types.

Swingle, C. F. Twentieth century handbook for steam engineers and electricians. 1916. Drake $3.
The electrical section occupies about one-third of this comprehensive manual.

Raymond, E. B. Motor troubles. 1908. McGraw $1.50.
How to trace and remedy them.

Electric Motors

***Moreton, D. P.** Electric motors direct and alternating; a practical book for the practical man. 1916. Drake $1.

Burns, E. E. Electric motor and its practical operation. 1912. Branch $2.
This also is plainly written for the man without technical training.

Crocker, F. B. and **Arendt, M.** Electric motors, their action, control and application. 2d ed. 1914. Van Nostrand $2.
A general and somewhat advanced treatment of principles, from the standpoint of operation, not design.

Armatures

Horstmann, H. C. and **Tousley, V. H.** Practical armature and magnet winding. 2d ed. 1916. Drake $1.

Direct Current Machinery

Jansky, C. M. Theory and practice of direct current machinery. 1917. McGraw $2.50.
A full elementary treatment, better adapted to home study than Sheldon. Outgrowth of a course in the Extension division of the University of Wisconsin.

Sheldon, S. and **Hausmann, E.** Dynamo electric machinery, its design, construction and operation: direct current machines. 9th ed. 1915. Van Nostrand $2.50.
A very good textbook for elementary courses.

Alternating Currents and Alternating Current Machinery

***Burns, E. E.** Alternating currents simplified. 1912. Branch $2.
Written for the practical worker, but aims to make the theory understandable in plain language rather than to cover applications.

Horstmann, H. C. and **Tousley, V. H.** Alternating current theory, practice and diagrams . . . . for electrical workers. 1914. Drake $1.

***Timbie, W. H.** and **Higbie, H. H.** Essentials of alternating currents. 1919. Wiley $1.60.
More of a text than Horstmann and Tousley or Burns, but is for the men who need a working understanding without expecting to lay the foundations for advanced study.

Timbie, W. H. and **Higbie, H. H.** Alternating current electricity and its application to industry. 2 v. 1914-16. Wiley $5.
v. 1. First course $2
v. 2. Second course $3
Covers the subject comprehensively without higher mathematics.

Magnusson, C. E. Alternating currents. 1916. McGraw $4.
A rather advanced work, but practical. Valuable section on long transmission lines.

Bailey, B. F. Induction motor. 1911. McGraw $2.50.

Taylor, W. T. Transformer practice. 2d ed. 1913. McGraw $2.50.

Storage Batteries

Pagé, V. W. Storage batteries simplified. 1917. Henley $1.50.
Practical aspects are quite comprehensively and thoroughly treated.

Lyndon, L. Storage battery engineering. 3d ed. 1911. McGraw $4.
A standard.

ELECTRIC POWER PLANTS AND TRANSMISSION

Shaad, G. C. Power stations and transmission. 1917. Amer. technical soc. $1.
Gives a concise working knowledge of the subject.

***Croft, T. W.** Central stations. 1917. McGraw $2.50
Practical, non-mathematical and comprehensive.

Weingreen, J. Electric power plant engineering. 2d ed. 1913. McGraw. $5.
The design, installation and operation of the electric end of the power plant. A standard work.

Lof, E. A. and **Rushmore, D. B.** Hydro-electric power station. 1917. Wiley $6.
The most authoritative and important American work on this phase of electric engineering.

Williams, S. B., comp. Cutting central station costs. 1919. McGraw $2.
A collection of methods and practices as developed or brought to general attention in the effort to counteract the additional burdens due to war conditions. Compiled from Electrical world.

Power Transmission and Distribution

Gear, H. B. and **Williams, P. F.** Electric central station distributing systems; their design and construction. 2d ed. 1916. Van Nostrand $3.50.
Comprehensive treatment covering substations, transformers and protective apparatus as well as both overhead and underground construction.

Meyer, E. B. Underground transmission and distribution for electric light and power. 1916. McGraw $3.
On practical construction work and testing.

Coombs, R. D. Pole and tower lines for electric power transmission. 1916. McGraw $2.50.
Gener book on standard practice.

National electric light assn. Handbook on overhead line construction. 3d ed. 1917. Author, N. Y. $5.
Official manual giving approved working methods in detail.

Raphael, F. C. Localization of faults in electric light and power mains. 1916. Van Nostrand $3.

ELECTRIC RAILWAYS

Fairchild, C. B. Training for the electric railway business. 1919. Lippincott $1.50.
Authoritative non-technical survey indicating its various aspects, opportunities and requirements.

***Spicer, C.** How to become a motorman; full instruction by Roger Burns, (pseud). 1917. Republican printing co., Elyria, O. $1.50

Blake, H. W. and **Jackson, W.** Electric railway transportation. 1917. McGraw $5.
Detailed practical study of traffic, organization and operating problems, collecting fares, freight and express, etc.

Electric Railway Engineering

Richey, A. S. and **Greenough, W. C.** Electric railway handbook. 1915. McGraw $4.
Manual of practical information and reference data.

Norris, H. H. Electric railways. 1913. Amer. technical soc. $1.50.
Aims to give a concise working knowledge of principles and practice.

International correspondence schools. Electric railways. (International library of technology, v. 136). 1915. International textbook co. $5.
This volume covers most aspects of electric street railway engineering.

Harding, C. F. Electric railway engineering. 2d ed. 1916. McGraw $3.
General treatment of a practical but more advanced type than the previous entry.

Jackson, W. Electric car maintenance; selected from the Electric railway journal. 1914. McGraw $3.
Compilation of methods and short cuts derived from experience.

Shephard, E. R. Modern practice in the construction and maintenance of rail joints and bonds in electric railways. (U. S. Bur. of standards. Technologic paper 62). 1916. Supt. of doc. .35.

ELECTRIC LIGHTING

Horstmann, H. C. and **Tousley, V. H.** Modern electric illumination, theory and practice. 1916. Drake $1.

Knox, C. E. and **Shaad, G. C.** Electric wiring and lighting. 1913. Amer. technical soc. $1.
Contains less elementary introductory matter than Horstmann and Tousley.

***Croft, T. W.** Practical electric illumination. 1917. McGraw $2.
A much more adequate treatment than the two books listed above, but avoids unnecessary technicalities and mathematics.

Illuminating engineering society. Illuminating engineering practice, lectures delivered at the University of Pennsylvania, Sept. 1916, by members of the Illuminating Engineering society. 1917. McGraw $5.
A collection of lectures of the highest authority on practical aspects of lighting. Not confined to electric lighting.

Clewell, C. E. Factory lighting. 1913. McGraw $2.
How to design and install the lighting equipment for most efficient results; also maintenance requirements.

Wiring

***Poppe, T. W.** House wiring. 2d ed. 1916. Henley .50.
Useful illustrated manual on the simpler phases of wiring.

Sharp, J. M. Practical electric wiring. 1916. Appleton $1.10
Well illustrated, but not so complete a working manual as Croft.

***Croft, T. W.** Wiring for light and power. 1917. McGraw $2.
Probably the most useful book to the average competent workman. Includes outdoor lighting.

Croft, T. W. Wiring of finished buildings . . . dealing with the commercial and technical phases of the subject. 1915. McGraw $2.
Valuable book on this class of work.

Cook, A. L. Interior wiring and systems for electric light and power service. 1917. Wiley $2.
Essentially practical but written from a somewhat more advanced standpoint than Croft. Stronger on layout and calculation of circuits.

Switchboards

Adams, C. C. Switchboards, switching, protective apparatus. 1914. Amer. technical soc. $1.
Concise descriptive text on typical apparatus and practice.

Harrison, N. Electric wiring, diagrams, and switchboards. 2d ed. 1916. Henley $1.50.

Baxter, W., Jr. Switchboards for power, light and railway service. 2d ed. 1913. Henley $1.50.
Essentially the same as 1906 edition but useful.

Meters and Testing

***Moreton, D. P.** Electrical measurements and meter testing. 1915. Drake $1.

For the electrician without technical training.

Jansky, C. M. Electrical meters. 2d ed. 1917. McGraw $3.

Standard descriptive and practical book on principles, types in general use, and applications in testing.

National electric light assn. Electrical meterman's handbook. 1915. Author, N. Y. $5.

Authoritative, exhaustive manual on meters and commercial practice in measuring electricity. Addendum 1917 included in copies now sold and available at 75 cents to libraries having the 1915 edition.

SPECIAL APPLICATIONS OF ELECTRICITY

(See also entries under Marine Engineering and Railroad Engineering)

Brown, H. W. Electrical equipment, its selection and arrangement, with special reference to factories, shops and industrial plants. 1917. McGraw $2.

Clewell, C. E. Handbook of machine shop electricity. 1916. McGraw $3.

Valuable book on the application of electricity in shops and factories, with cost data and other practical details.

Electricity in Mining

(See also Coal Mining)

Patchell, W. H. Application of electric power to mines and heavy industries. 1913. Van Nostrand $4.

Paterson, G. W. L. Electric mine signalling installations. 1913. Van Nostrand $1.50.

Clark, H. H. and **Ilsley, L. C.** Approved electric lamps for mines (U. S. Mines. Bul. 131.) 1917. Supt. of doc. .20

Electric Welding

Burgess, C. F. and **Cravens, C. W.** Applied electrochemistry and welding. 1917. Amer. technical soc. $1.50.

Nearly two-thirds of the book is on welding. There are about 30 pages on the electric furnace.

Electric welding. 1914. Industrial press .25

Machinery's reference series no. 127.

Hamilton, D. T. and **Oberg, E.** Electric welding; a comprehensive treatise on the practice of the various resistance and arc welding processes. 1918. Industrial press. $2.50.

The most complete book.

Electric Heating

Wilcox, E. A. Electric heating. 1916. Technical pub. co. $2.50
Comprehensive descriptive work with many illustrations.

Electric Furnaces

Stansfield, A. Electric furnace, its construction, operation and uses. 2d ed. 1914. McGraw $4.
A standard treatise.

Lyon, D. A. Electric furnace in metallurgical work. (U. S. Mines. Bul. 77). 2d ed. 1916. Supt. of doc. .25
Bulletin of 216 p.

Lyon, D. A. and **Keeney, R. M.** Electric furnaces for making iron and steel. (U. S. Mines. Bul. 67). 1914. Supt. of doc. .20
Bulletin of 142 p. Rodenhauser's Electric furnaces in the iron and steel industry (2d ed. 1917) will not be needed by most libraries, this bulletin or Stansfield being sufficient for their needs.

Electricity on the Farm

Western electric co. Farmer's electrical handbook. 2d ed. 1917. Author, N. Y. .50
150 page illustrated pamphlet with special reference to their own products but with suggestions of general value.

Koester, F. Electricity for the farm and home. 1913. Sturgis $1.
A more inclusive book than Anderson which assumes isolation from any commercial source of supply.

*__Anderson, F. I.__ Electricity for the farm. 1915. Macmillan $1.50
"Light heat and power by inexpensive methods from the water wheel or farm engine." Practical and suggestive.

Motion Picture Operation

Horstmann, H. C. and **Tousley, V. H.** Motion picture operation, stage electrics and illusions. 1917. Drake $1.
Useful book where Richardson cannot be afforded.

Richardson, F. H. Motion picture handbook; a guide for managers and operators of motion picture theatres. 3d ed. 1916. Moving Picture World $4.
The most complete book on the operation of moving picture machines and on all the related electrical apparatus and connections. Does not take up the making of moving pictures.

Electroplating

Reetz, H. C. Electroplating. 1911. Popular mechanics, Chic. .50
Work on a small scale.

Weston, J. H. Electro-platers handbook. 1915. Drake $1.
A practical working manual.

Langbein, G. Complete treatise on the electro-deposition of metals. 7th ed. 1913. Baird $5.
Full general treatise including a section on galvanoplastic reproduction.

TELEPHONY

Moreton, D. P. Drake's telephone handbook; a book for the practical man. 1915. Drake $1.
Principles and practice covered in an elementary way.

***Smith, A. B.** Modern American telephony in all its branches. 1912. Drake $2.
Good general work, sufficiently full for small libraries.

McMeen, S. G. and **Miller, K. B.** Telephony. 1912. Amer. technical soc. $4.
A very full treatise, the best on the subject. Publishers report (May 1919) new edition contemplated, but date of publication entirely indefinite.

***Jansky, C. M.** and **Faber, D. C.** Principles of the telephone, pt. 1: subscriber's apparatus. 1916. McGraw $1.50
This is all published to date. Other volumes on central office and on outside construction are planned.

Shepardson, D. G. Telephone apparatus; an introduction to the development and theory. 1917. Appleton $3.
A valuable book for students which assumes a rather advanced knowledge of electricity and mathematics. Treats chiefly of apparatus as distinguished from circuits.

Smith, A. B. and Campbell, W. L. Automatic telephony. 1914. McGraw $4.
Full and technical; important and useful in its field.

William Hood Dunwoody industrial institute. Telephony, substation course no. 1, unit T3. 1917. Author, Minneapolis .68
Useful for detailed instructions and diagrams on wiring for and installing telephone instruments.

TELEGRAPHY

Operator's Manuals

Jones, W. H. Telegraphy for beginners. 2d ed. 1913. Spon .50

Edison, T. A. Telegraphy self-taught. 1918. Drake $1.
The author is not Thomas A. Contains more practice material than Jones.

***Dodge, G. M.** Telegraph instructor. 6th ed. 1917. Author, Valparaiso, Ind. $1.25
This deals very fully with telegraph practice in railroad work, in addition to general operation.

Telegraph Engineering

Macomber, G. S. Modern land and submarine telegraphy. 1914. Amer. technical soc. .75

Brief practical outline.

Jones, W. H. Pocket edition of diagrams and complete information for telegraph engineers and students. 1915. Telegraph and telephone age, N. Y. $2.

Comprehensive and reliable manual. Much more than a handbook of wiring diagrams.

Hausmann, E. Telegraph engineering; a manual for practicing telegraph engineers and engineering students. 1915. Van Nostrand $3.

Assumes considerable knowledge of electricity and mathematics. A long section on theory and practice relating to telegraph lines; on most other aspects it is less complete than McNicol.

***McNicol, D.** American telegraph practice; a complete technical course in modern telegraphy including simultaneous telegraphy and telephony. 1913. McGraw $4.

The best general treatise.

WIRELESS TELEGRAPHY AND TELEPHONY

U. S. Army Signal corps. Principles underlying radio communication. (Radio pamphlet no. 40). 1919. Supt. of doc. .55

Valuable recent publication of 350 pages, bound in fabrikoid. Was prepared for use with students having little scientific preparation, and covers fully and plainly the electrical principles that bear most directly on radio work.

***Hayward, C. B.** How to become a wireless operator. 1918. Amer. technical soc. $1.50

A non-mathematical text for home study, aiming to cover the subject thoroughly enough to prepare for a government license.

***Bucher, E. E.** Practical wireless telegraphy. 1917. Wireless press $1.75

Gives a working knowledge of principles and detailed information on apparatus and practice.

Robison, S. S. Manual of radiotelegraphy and telephony for the use of naval electricians. 4th ed. 1918. U. S. Naval institute. $1.50

Principles and practice are treated more systematically than in Bucher.

Fleming, J. A. Elementary manual of radio telegraphy and radiotelephony for students and operators. 3d ed. 1916. Longmans $3.20

A standard book emphasizing principles. This author has also written an exhaustive treatise entitled Principles of electric wave telegraphy and telephony.

Bucher, E. E. Vacuum tubes in wireless communication. 1918. Wireless press. $1.75

Year-book of wireless telegraphy and telephony. 1918. Wireless press, Lond. 6/

An annual which includes laws and regulations of various countries; land and ship stations, their range and other data; miscellaneous information relating to wireless; a wireless map of the world.

Goldsmith, A. M. Radio telephony. 1918. Wireless press $2.

Reliable book, the only recent work covering the subject comprehensively.

BUILDING

(Note: It has seemed best to include some inexpensive books on domestic architecture and house planning and on architectural drawing for the carpenter and builder, in addition to books on building construction.)

DOMESTIC ARCHITECTURE AND HOUSE PLANNING

***Robinson, L. E.** Domestic architecture. 1917. Macmillan $1.50

A simple comprehensive textbook covering furnishing and equipment as well as planning and construction. Most of the text is applicable to small suburban and farm houses.

***White, C. E.** Successful houses and how to build them. 1912. Macmillan $2.

A particularly valuable and complete book for the prospective owner. Author is an architect and the book should help the builder who prepares or adapts his own plans.

***Arthur, W.** Home builder's guide . . . covering the selection of the site, the planning of the rooms and proper materials to use in construction. 1914. U. P. C. book co. $1.50.

Specific advice on planning details and on the best materials and methods of construction.

Keith, W. J. Building of it; a pocket guide and manual on construction. 1915. M. L. Keith, Minneapolis $1.

Primarily for the layman who must superintend the work on his own house. Practical details in non-technical language so that correct workmanship may be insisted on.

***Keith, W. J.** Keith's house plans. M. L. Keith, Minneapolis ea. $1.

v. 1	Bungalows, up to	$5,000
v. 2	Attractive houses up to	$3,000
v. 3	Attractive houses up to	$4,000
v. 4	Attractive houses up to	$6,500
v. 7	Designs for cement and brick	
v. 8	Garages, $150 up	
v. 9	Interiors beautiful	
v. 10	Building the house, a handbook on construction	
v. 11	Duplex houses and flats	
v. 12	Artistic houses, $3,000 to $10,000	

These are very useful and suggestive in planning new houses.

Holst, H. V. von. Modern American homes. 1918. Amer. technical soc. $2.

Good illustrations, with floor plans, of houses of moderate cost representative of the individuality and dignified simplicity now favored.

Butterfield, W. H. and Tuttle, H. W. Book of house plans. 1912. McBride. $2.

The floor plans are carefully drawn and the 21 houses represent a variety of types costing (1912) about $3,000 to $6,000. Descriptive text.

Upper Arlington co. Plan book of modern houses; 40 plans submitted in a national competition. 1918. Author, Columbus $1.
Paper covered book of plans and general views of houses to cost $6,000. No descriptive text.

Dustman, U. M. Construction of dwelling houses and bungalows. 1916. Stanton $1.
A collection of plans, with itemized "bill of materials" required in each case.

***Saylor, H. H.** Bungalows. 1913. McBride $2.50
Good comprehensive book on the bungalow type of house.

Comstock, W. P. Bungalows, camps and mountain houses. 2d ed. 1915. Comstock $2.
Plans and general views with rather brief text.

Farm Buildings

(See also Concrete on the Farm under the general heading Concrete Construction)

***Breeders' gazette.** Farm buildings. New ed. 1919. $3.
A comprehensive collection of best plans selected from Breeders' gazette, with full explanatory text.

Hopkins, A. Modern farm buildings. 1916. McBride $2.50.
A general book on both plans and construction, with less technical information on building and more illustrations than Ekblaw.

***Ekblaw, K. J. T.** Farm structures. 1914. Macmillan $1.75
Not a book of plans but a reliable work on materials, construction methods, lighting and heating, etc.

Roberts, H. A. The farmer his own builder. 1918. McKay $1.25.
Especially intended for the farmer carrying out his own extensions and improvements.

Shearer, H. A. Farm buildings, with plans and descriptions. 1917. Drake $1.
One-third of the book is devoted to "comfortable farm houses." Most of the books under this heading give little attention to farm houses.

French, T. E. and **Ives, F. W.** Agricultural drawing and the design of farm structures. 1915. McGraw $1.25.
For students in agricultural courses. The section on farm structures covers only about 40 pages, and, though good, is necessarily rather inadequate.

Architectural Drawing

***Dale, R. B.** Drawing for builders; a problem course in architectural drawing. 1916. Wiley $1.50
A good book for its purpose, suitable for home study, night schools, etc.

Windoes, R. F. and **Campbell, H. B.** Architectural drawing for secondary schools. 1917. Webb $1.50.
Well illustrated text, to follow a acourse in general drawing. Both text and drawings are very practical and would be suitable for study by young carpenters.

Edminster, C. F. Architectural drawing. 11th ed. 1919. U. P. C. book co. $2.50.
Considered one of the best practice courses, but less suited than the previous entries for home study for carpenters.

Greenberg, A. B. and **Howe, C. B.** Architectural drafting. 1913. Wiley $1.50.
A text on fundamentals, to be used in conjunction with a set of loose-leaf problem plates on the orders of architecture (set of 20 for 50 cents). Includes appendices on specifications and estimating.

Radford, W. A. and **others.** Radford's architectural drawing. 1913. Radford $1.50.
Designed to aid the carpenter with some experience to attain broader success through a knowledge of architectural drafting.

BUILDING CONSTRUCTION

(See also Construction Work; Materials of Engineering; Structural Engineering)

International correspondence schools. [Building]. (International library of technology, v. 30B, 31B, 32B, and 33C). 4v. International textbook co. ea. $5.
Volumes 30B and 31B are especially likely to prove useful. They cover foundations and masonry, carpentry, brickwork, lathing and plastering, etc. For detailed contents of the four volumes, see the catalog issued by the publishers.

*Kidder, F. E. Building construction and superintendence. 3 v. 1915-16. Comstock $15.

v. 1 Mason's work. 9th ed.	$6.00
v. 2 Carpenter's work. 9th ed.	$6.00
v. 3 Trussed roofs and roof trusses. 3d ed.	$3.00

The standard American work treating comprehensively building practice relating to frame, brick and stone structures.

*Radford, W. A. Portfolio of details of building construction. 1911. Radford $1.
The details are drawn to scale and large enough to be clear. They cover a wide range and are accompanied by very brief explanatory text. A book, not loose plates.

Martin, C. A. Details of building construction. 1914. Bates $2.
Book of well drawn plates with explanation on the plates themselves. Not so miscellaneous as Radford, but a book of higher grade.

Colwell, H., ed. Kinks for the builder . . . relating to house construction . . . compiled from Building age. 1916. U. P. C. book co. $1.

White, L. and **Prentis, E. A.** Modern underpinning; development, methods and typical examples. 1917. Wiley $1.50.
Especially as developed to meet the needs of New York during subway construction. Photographs and drawings supplementing the text are a valuable feature.

Travelers insurance co. Treatise on safety engineering as applied to scaffolds. 1915. Author, Hartford, Conn. $3.
Valuable publication.

Handbooks

International correspondence schools. Building trades handbook; a convenient reference book on building construction. 3d ed. International textbook co. .50
Concise illustrated handbook giving a summary of useful information on structural design, masonry, carpentry and other subjects.

Richey, H. G. Building foreman's pocket book and ready reference. 1909. Wiley $5.
In addition to building in general, this manual covers such facts on the several building trades as are likely to be most needed by a foreman.

***Kidder, F. E.** Architects' and builders' pocketbook. 16th ed. 1916. Wiley $5.
The standard comprehensive reference manual in this field, containing sections contributed by experts.

Waterproofing

Ross, J. Waterproofing engineering for engineers, architects, builders, roofers and waterproofers. 1919. Wiley $5
The only comprehensive treatment of the subject.

Fireproof Construction

Fitzpatrick, F. W. Fireproof construction. 1914. Amer. technical soc. $1.50
Introductory practical book, about one-third on fire and fire losses, and two-thirds on fireproof construction.

Freitag, J. K. Fire prevention and fire protection as applied to building construction; a handbook of theory and practice. 1912. Wiley $4.
General treatise for the architect and builder.

Fire prevention and fire protection. 3d ed., rev. by A. C. Hutson. 1916. Spectator co., N. Y. $4.25
Very comprehensive manual, primarily from the standpoint of insurance hazards, but with details on materials and practice of value to the contractor and builder.

Dana, G. Automatic sprinkler protection. 2d ed. 1919. Wiley $3.50
Covers the subject fully, with mechanical details of the various types of apparatus.

Building Superintendence

***Nichols, E.** Building superintendence for brick, frame, stone buildings. 1917. Amer. technical soc. $1.50

*Post, C. L. Building superintendence for reinforced concrete structures. 1917. Amer. technical soc. $1.

*Belden, E. S. Building superintendence for steel structures. 1917. Amer. technical soc. $1.

Each of these three volumes gives a concise outline of the duties of the superintendent of construction, and the things he should know about materials and methods applicable to each class of buildings.

Contracts, Specifications and Business Aspects

(See also these topics under Engineering)

*Nichols, E. Contracts and specifications; a working manual of correct forms. 1917. Amer. technical soc. $1.

Very concise outline covering essential points in specification writing and applications to suburban and city work.

American institute of architects. Standard documents. 3d ed. 1918. Author, Washington .15.

Authoritative models for the guidance of architects and builders.

Fitzpatrick, F. W. Building code. 1913. Amer. technical soc. $1.

A summary of provisions selected from many local codes, aiming to represent the best practice with special emphasis on fire prevention.

Blake, C. H. Law of architecture and building; a consideration of the mutual rights, duties and liabilities of architect, owner and contractor, with appendices and forms. 1916. Comstock $3.

A reliable treatise in non-legal language.

Estimating

*Joslin, A. W. Estimating the cost of buildings. 2d ed. 1913. U. P. C. book co. $1.50

Based on articles that appeared in a trade journal. Introductory chapters on plan reading have been added to adapt the book to beginners and trade school use. More general and thorough than Nichols.

Nichols, E. Estimating. Amer. technical soc. $1.

General instructions and data followed by detailed estimates for a residence.

Arthur, W. Estimating building costs. 1917. U. P. C. book co. $1.

A condensed handbook of data and methods restricted to the construction of homes and small buildings.

*Arthur, W. New building estimator. 12th ed. 1916. U. P. C. book co. $3.

A well-known manual, probably the most useful single purchase for the average collection. Radford's Estimating and Hodgson's Estimator's and contractor's guide are serviceable for libraries that require a large representation on this subject.

Walker, F. R. Building estimator's reference book. 3d ed. 1919. Author, Chicago $5.

Important book of more than 1500 pages containing data on materials and costs from recent work. Large gaps in the paging, left for new data to be added on each main subject, account for the indicated total paging. Monthly supplements are issued.

Radford, W. A. and **Peker, C. G.** How to read plans and take off bills of material. 1917. Radford $1.
Addressed to the retail lumberman and the building contractor. The subject is illustrated by a large number of drawings and detailed descriptive text. A large book of 250 pages. Low price due to its being a trade publication.

Dale, R. B. Arithmetic for carpenters and builders. 1915. Wiley $1.25.
Beginning with fractions, the main subjects in arithmetic are outlined and applied to problems of direct interest and importance to builders.

MASONRY

Richey, H. G. Building mechanic's ready reference: stone and brick mason's edition. 1907. Wiley $1.50.
One-half of this manual contains plainly written instructions on principles and practice, the other contains tables and data.

Howe, M. A. Masonry; a short text-book on masonry construction, including descriptions of the materials used. 1915. Wiley $1.50.

***Hodgson, F. T.** Practical stone masonry self taught. 1908. Drake $1.
Intended for home study by the worker learning through experience. Describes methods used in practice in laying out and executing masonry construction.

Kidder, F. E. Mason's work. 9th ed. 1916. Comstock $6.
Comprehensive treatise on foundations, stone work, brickwork, terra cotta, fireproofing, lathing and plastering, etc. (v. 1 of his Building construction.)

Bricklaying

(Note: One of the few good American books on bricklaying, is out of print but may be seen in many libraries. It is Bricklaying, by O. B. Maginnis. 1900.)

***Hodgson, F. T.** Practical bricklaying self taught. 1908. Drake $1.
Intended for home study.

Gilbreth, F. B. Bricklaying system. 1909. McGraw $3.
For the foreman and contractor. Describes, with many good illustrations, the author's applications of his well-known motion study ideas to the promotion of speed and efficiency.

Radford, W. A., comp. Radford's brick houses and how to build them. 1912. Radford $1.
In addition to designs and floor plans, the book contains a large amount of very practical information on brick construction work.

Cement, Concrete and Plaster

(See also Concrete Construction under Civil Engineering)

Richey, H. G. Building mechanic's ready reference: cement workers' and plasterers' edition. 1908. Wiley $1.50.
Covers cements, mortars and concrete, cement blocks, lathing and plastering, miscellaneous rules, tables, etc.

Hodgson, F. T. Mortars, plasters, stuccos, artificial marbles, concretes, Portland cements and composition . . . including a practical treatise on reinforced concrete. 1916. Drake $.50.
A rather incompletely digested compilation on tools, materials and working methods. Cover title reads "Concretes, cements, mortars" etc.

***Lewis, M. H.** Popular handbook for cement and concrete users. 1911. Henley $2.50.
Very comprehensive and comparatively non-technical book on principles, methods and applications in the use of concrete and reinforced concrete.

Concrete Houses

Whipple, H. M. and **Gilbert, C. D., eds.** Concrete houses and how they were built. 1917. Concrete-cement age $1.
Compilation of about 40 short articles from the periodical Concrete, illustrating and describing a variety of types, and giving some construction details.

***Sloan, M. M.** Concrete house and its construction. 1912. Portland cement assn. $1.
An attractive book which describes and illustrates methods of construction in sufficient detail to be of value to the builder.

STEEL CONSTRUCTION

(See also Structural Engineering)

Hodgson, F. T. Practical steel construction. 1913 Drake .75.
Very elementary introduction to a working knowledge of structural steel standard shapes and the use of steel in buildings.

***Burt, H. J.** Steel construction; a text and reference book covering the design of steel framework for buildings. 1914. Amer. technical soc. $2.
The best elementary book on the use of steel in building construction.

CARPENTRY

(Note: Books on elementary woodworking and the use of tools are not included. One of the best books of that type for a library collection is Griffith's Woodwork for secondary schools. It gives an introductory knowledge of many kinds of work with wood.)

King, C. A. Constructive carpentry. 1912. Amer. book co. .70.

King, C. A. Inside finishing. 1912. Amer. book co. .80.
These are very elementary but good books, intended for short courses in manual training and trade schools.

Griffith, I. S. Carpentry. 1916. Manual arts $1.
Brief, but very good outline of carpentry as applied to building. Suitable for trade schools and apprentices.

***Townsend, G.** Carpentry and joinery; a practical treatise on simple building construction. 1918. Amer. technical soc. $1.50.
Much fuller and more professional than Griffith. More systematic than Hodgson or Radford.

Radford, W. A. Practical carpentry. 2v. 1907. Radford $2.
A well-known book for the practical workman, presenting approved methods in plain language. Each volume ends with a chapter of questions and answers.

***Hodgson, F. T.** Modern carpentry. 2v. 1917. Drake $2
Presents the methods of general practice in simple language. Applied geometry and mechanics useful to the carpenter are included.

Kidder, F. E. Carpenter's work. 9th ed. 1915. Comstock $6.
Detailed work covering building woods, framing and general construction, outside and incide finishing, builders' hardware, specfications, etc. (v. 2 of his Building construction).

Crussell, E. H. Jobbing work for the carpenter. 1914.
U. P. C. book co. $2.
For the professional carpenter. On making store counters, book cases, general repairs, and a wide variety of other work.

Framing and Roofs

Meloy, D. H. Progressive carpentry. 1900. U. P. C. book co. $1.
Small plainly written book on how to obtain by the shortest methods bevels and cuts for any form of framework.

Radford, W. A. Framing, a practical manual of approved up-to-date methods of house framing and construction. 1909. Radford $1.
Includes also some applications to the construction of barns and other types of buildings.

Maginnis, O. B. How to frame a house. 7th ed. 1914.
Comstock $1.50.
Treats of the frame house, framing for a brick house, roof and miscellaneous framing, rustic carpentry, and how to move a house.

***Hodgson, F. T.** Light and heavy timber framing made easy. 1909.
Drake $2.
Gives special attention to the framing of heavy timbers.

Jacoby, H. S. Structural details, or elements of design in heavy framing. 1909. Wiley $2.25
A textbook whose purpose is to apply to timber framing accurate methods for calculating the strength and proportions of joints and of the several types of framing details.

Kidder, F. E. Trussed roofs and roof trusses. 3d ed. 1910.
Comstock $3.
Treats of advanced work such as church roofs, domes, armory and exposition buildings. (v. 3 of his Building construction).

Stair Building

Hodgson, F. T. Common-sense stair building and handrailing. 1913.
Drake $1.
Four methods are worked out in successive sections.

Williams, M. Stair builders' guide. 1914. U. P. C. book co. $2.
A better and more complete book than Hodgson, well illustrated with line drawings.

Steel Square

*Hodgson, F. T. Practical treatise on the steel square and its application to everyday use. 2v. 1913-17. Drake $2.
Demonstrates in a simple manner the many uses of this instrument in the ordinary work of the carpenter. The best book on the subject.

CORNICE WORK AND ROOFING

Metal worker plumber and steam fitter. Practical sheet metal work and demonstrated patterns, v. 1-8. 1910-12. U. P. C. book co. ea. $1.50.

- v. 1 Leaders and leader heads
- v. 2 Gutters and roof outlets
- v. 3 Roofing
- v. 4 Ridging and corrugated iron work
- v. 5 Cornice patterns
- v. 6 Circular cornice work
- v. 7 Practical cornice work
- v. 8 Skylights

Johnston, S. P. Cornice work manual. Stern, Chic. $3.50
This is apparently an exact reprint of the 1900 edition. Probably v. 5-7 in the set above will prove a more useful purchase.

HOUSEHOLD SANITATION

(See also Water Supply and Sewage Disposal)

*Keene, E. S. Mechanics of the household. 1918. McGraw $2.50
Treats practically but in non-technical language heating, plumbing, water supply, sewage disposal, ventilation, etc. Very suitable for a general library collection.

Gerhard, W. P. Sanitation, water supply and sewage disposal of country houses. 2d ed. 1914. Van Nostrand $2.
A detailed explanation of principles and their applications, but not a manual of methods for the worker.

Gerhard, W. P. Water supply, sewage and plumbing of modern city buildings. 1910. Wiley $4.
Authoritative and rather technical book, written for sanitary engineers and for architects and building inspectors.

PLUMBING

Dibble, S. E. Elements of plumbing. 1918. McGraw $1.50.
A good beginner's text, for it assumes no background of experience or general technical training.

Starbuck, R. M. Questions and answers on the theory and practice of sanitary plumbing. 9th ed. 1909. U. P. C. book co. ea. $1.

- v. 1 Drainage and venting
- v. 2 Range boiler work; hot water supply and circulation.

*Gray, W. B. and Ball, C. B. Plumbing; a working manual. 1916. Amer. technical soc. $1.50.
Good concise book on the most usual fixtures and connections.

*Starbuck, R. M. Standard practical plumbing. 1910. Henley $3.
A fuller but plainly written book, very useful even to men of considerable experience on account of its thorough treatment of fundametals. His Modern plumbing illustrated supplements this for experienced workers.

Cosgrove, J. J. Principles and practice of plumbing. 2d ed. 1914. Standard sanitary mfg. co., Pittsburgh $4.
One of the good books for experienced workmen.

Gray, W. B. Gray's plumbing design and installation. 1916. U. P. C. book co. $5.
For the master plumber. An important work treating in detail the more advanced aspects of the plumbing trade.

Hutton, W. Hot water supply and kitchen boiler connections. 1913. U. P. C. book co. $2.

*Hutton, W. Country plumbing practice. 1914. U. P. C. book co. $2.

Hutton, W. Lead working, pipe bending, tank and roof work. 1917. U. P. C. book co. $1.

Richey, H. G. Building mechanics' ready reference; plumbers', steamfitters' and tinners' edition. 1908. Wiley $1.50.

Johnson, J. W. Johnson's new handy manual on plumbing, heating, ventilation, and mechanical refrigeration. 7th ed. 1913. Author, Chicago $1.

Cosgrove, J. J. Plumbing plans and specifications. 1910. Standard sanitary mfg. co., Pittsburgh $3.
"Shows how to indicate the work on plans and describe it in specifications."

Metal worker, plumber and steam fitter. Estimating, cost keeping and profit making in the plumbing, heating and sheet metal trades. 1914. U. P. C. book co. $2.50.
A guide to up-to-date and systematic business methods as adapted to these trades.

Pipes and Pipe-Fitting

(Note: Many of the books on Plumbing and on Steam and hot water heating include this subject.)

Gerhard, W. P. Superintendence of piping installations in buildings. 1907. McGraw $1.
Concise manual describing good practice in locating and connecting up piping for various uses.

Snow, W. G. Pipe fitting charts for steam and hot water; also galvanized iron piping for fan and indirect systems. 1912. U. P. C. book co. $2.
Clear diagrams with brief text.

Collins, H. E. Pipes and piping. 1908. McGraw. $1.
Good practical book dealing chiefly with steam piping in power plants.

*Svensen, C. L. Handbook on piping. 1918. Van Nostrand $4.
The only book that covers the subject comprehensively.

Johnston, A. L. Steam piping, its economical design and correct layout. 1916. Engineering magazine co., N. Y. $2.

HEATING AND VENTILATING

*Hubbard, C. L. Ventilation handbook; the principles and practice of ventilation as applied to furnace heating. 1916. U. P. C. book co. $2.
Reliable elementary book in the form of questions and answers. Not a handbook of data, etc.

Hubbard, C. L. Heating and ventilation; a working manual of approved practice. 1916. Amer. technical soc. $1.50.
Introductory outline of the several systems in common use. A more advanced treatment is contained in the second volume of his Power, heating and ventilation. McGraw $2.50.

Fuller, C. A. Designing heating and ventilating systems. 1914. U. P. C. book co. $2.
Based on lectures to Y. M. C. A. classes and not highly technical.

Allen, J. R. and Walker, J. H. Heating and ventilation. 1918. McGraw $3.
An authoritative text for college students in engineering and architecture.

*Carpenter, R. C. Heating and ventilating buildings. 7th ed. 1918. Wiley $3.50.
A standard comprehensive treatise.

Harding, L. A. and Willard, A. C. Heating and ventilation. 1916. McGraw $4.
This is the first volume of their Mechanical equipment of buildings, an important reference work for architects and engineers.

Hoffman, J. D. and Raber, B. F. Handbook for heating and ventilating engineers. 2d ed. 1913. McGraw $3.50.
Reliable and useful manual. Includes district heating and refrigeration.

Ventilating Fans

Sturtevant, B. F. co. Heating and ventilation. 1914. Author, Hyde Park, Boston $1.
Trade publication of unusual value, issued by a leading manufacturer of fans and blowers.

Carrier, W. H. Engineers handbook of tables, charts and data on the application of centrifugal fans and fan system apparatus. 1914. Buffalo forge co., Buffalo, N. Y. $3.

Furnace Heating

King, A. G. Progressive furnace heating; a practical manual of designing, estimating and installing modern systems. 1914. U. P. C. book co. $2.50.
With supplement by Neubecker on the layout and construction of furnace fittings.

***Snow, W. G.** Furnace heating. 5th ed. 1915. U. P. C. book co. $2.
Written on a little more advanced plane than King, but is thoroughly practical and includes a section on furnace fittings.

Steam and Hot Water Heating

King, A. G. 500 plain answers to direct questions on steam, hot water, vapor and vacuum heating. 1915. Henley $1.50.

Lincoln, H. C. Steam and hot water heating. 1912. U. P. C. book co. $1.50.
A concise outline intended for study. Test questions follow each chapter, but there are no problems to be worked out.

Snow, W. G. Principles of heating; a practical and comprehensive treatise on applied theory in heating. 1912. U. P. C. book co. $2.
Gives considerable attention to losses in transmission.

***King, A. G.** Practical steam and hot water heating and ventilation. 2d ed. 1912. Henley $3.
A standard general work, well illustrated.

Pierce, E. R. Practical manual of steam and hot water heating. 1911. Domestic engineering, Chic. $2.50.
Useful facts and comments based on long experience. Not a completely rounded treatment, but gives many practical details.

District Heating

Gifford, B. T. Central station heating. 2d ed. 1918. Heating and ventilating magazine co., N. Y. $3.
Comprehensive treatment covering both engineering and commercial aspects.

LIGHTING

(See also Electric Lighting)

***Luckiesh, M.** Lighting art, its practice and possibilities. 1917. McGraw $2.50
Emphasis is on the relation of effective lighting to interior decoration and to architecture.

Bell, L. Art of illumination. 2d ed. 1912. McGraw $2.50.
A standard general treatise, that now requires supplementing on recent types of fixtures and lamps.

Illuminating engineering society. Illuminating engineering practice; lectures delivered at the University of Pennsylvania, Sept. 1916, by members of the Illuminating engineering society. 1917. McGraw $5.

Principles and practice are authoritatively presented from a great many angles.

Gerhard, W. P. American practice of gas piping and gas lighting. 1908. McGraw $3.

A general treatise on the use of gas for lighting and other domestic purposes. A chapter on the arrangement of gas pipes in buildings is of interest to the builder.

Godinez, F. L. Display window lighting and the city beautiful; facts and new ideas for progressive merchants. 1914. Comstock $2.

Very practical book on what may be accomplished and how.

Wisconsin. Industrial commission. Industrial lighting; a handbook for superintendents and electricians. 1917. Author, Madison gratis.

Valuable document of 91 pages, of which the keynote is "safety demands good lighting."

HOUSE PAINTING AND DECORATING

Sabin, A. H. House painting, glazing, paper-hanging and whitewashing. 1908. Wiley $1.

Elementary book by an authority; especially adapted to the property owner.

Maire, F. Modern painter's cyclopedia. 1918 ed. Drake $1.75

A useful compilation.

Vanderwalker, F. N. Estimates, costs and profits for house painting and interior decorating. Rev. ed. 1917. Drake $1.50

For the contracting painter.

Maire, F. Exterior painting. 1910. Drake .60

Maire, F. Interior painting 1910. Drake .60

Two reliable instruction books for the beginner, with test questions.

Kelly, A. A. Expert house painter. 1913. Author, Downington, Pa. $3.50

For the experienced worker. Treats both exterior and interior work.

Jennings, A. S. Paint and color mixing; a practical handbook for painters, decorators, paint manufacturers, etc. 5th ed. 1915. Spon $2.50

Includes several plates of mounted samples in color.

Smith, J. C. Paint and painting defects, their cause and cure. 1912. Painters' magazine, N. Y. $3.

The material is arranged alphabetically and covers many topics.

Jennings, A. S. Commercial paints and painting; a handbook for architects, engineers, property owners, painters and decorators. 1914. Van Nostrand $2.

Sherwin-Williams co. Your home and its decoration. 1910. Author, Cleveland $2.

Though written chiefly for the property holder, contains information and formulae helpful to the painter.

Kelly, A. A. Expert interior decorator . . . a manual of reference in the are of painting and decorating the walls of residences, public buildings, etc. 1917. Author, Downingtown, Pa. $2.

For the experienced painter. Not illustrated.

Maire, F. Graining and marbling. 1910. Drake .60

Elementary.

Maire, F. Wood finisher. 1911. Drake .60.

Hodgson, F. T. Up-to-date hardwood finisher. 1915. Drake $1.

***Kelly, A. A.** Expert wood finisher. 2d ed. 1915. Author, Downingtown, Pa. $3.

For the experienced worker. Not illustrated.

Kelly, A. A. Expert paper hanger. 1912. Author, Downingtown, Pa. $2

MINING AND METALLURGY

ECONOMIC GEOLOGY AND PROSPECTING

Ries, H. Economic geology; with special reference to the United States. 4th ed. 1916. Wiley $4.
A standard general work covering not only metals but coal, petroleum, building stones, minor minerals, etc.

Richardson, C. H. Economic geology. 1913. McGraw $2.50.
A textbook on the nature and origin of ores and on the properties, occurrence and uses of the various metals. Non-metallic minerals are not included.

Wallace, J. P. Study of ore deposits for the practical miner. 1908. McGraw $3.
Reliable statement of the main geological facts and description of the types of ore deposits. Includes a section on minerals and rocks, for the prospector.

McLeod, A. Practical instructions in the search for and the determination of the useful metals, including the rare ores; for the prospector, miner, etc. 2d ed. 1917. Wiley $1.75.

QUARRYING

Greenwell, A. and **Elsden, J. V.** Practical stone quarrying. 1913. Appleton $4.
Based chiefly on English practice, but the best available book.

Bowles, O. Sandstone quarrying in the United States. (U. S. Mines. Bul. 124). 1917. Supt. of doc. .25.

Bowles, O. Technology of marble quarrying. (U. S. Mines. Bul. 106). 1916. Supt. of doc. .25.

Dale, T. N. and **others.** Slate in the United States. (U. S. Geol. S. Bul. 586). 1914. Supt. of doc. .50.
These are three important illustrated pamphlets which include good descriptions of methods of working. The one on slate contains 220 pages the others about 150.

MINING ENGINEERING

(See also Underground Surveying; Tunneling)

Peele, R. Mining engineers' handbook. 1918. Wiley $5.
Very complete reference manual of more than 2000 pages, written by a staff of specialists. Bibliographies follow each section.

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*Young, G. J. Elements of mining. 1916. McGraw $5.
Good treatise covering the main features of general practice without attempting a separate consideration of special methods in the mining of coal and individual metals.

Hoover, H. C. Principles of mining. 1909. McGraw $2.50.
The emphasis is on valuation, organization, etc. Mining engineering practice is briefly outlined.

***Crane, W. R.** Ore mining methods. 2d ed. 1917. Wiley $3.50
Authoritative work on this branch of mining.

Engineering and mining journal. Handbook of mining details. 1914. McGraw $4.

Engineering and mining journal. Details of practical mining. 1916. McGraw $5.
Two compilations of valuable matter from the files of the Engineering and mining journal.

Sanders, W. E. and **others.** Mine timbering. 1907. McGraw $2.
A series of papers by men of special experience in this work.

Brunton, D. W. and **Davis, J. A.** Safety and efficiency in mine tunnelling. (U. S. Mines. Bul. 57). 1916. Supt. of doc. .35.
Pamphlet of 271 pages on recent practice in tunnelling, a subject on which there is little book material.

McCrystle, J. Mine tracks, their location and construction. 1918. McGraw $1.50.

Munroe, C. E. and **Hall, C.** Primer of explosives for metal miners and quarrymen. (U. S. Mines. Bul. 80). 1915. Supt. of doc. .25
Fully illustrated pamphlet of more than 100 pages.

Wilson, E. B. Hydraulic and placer mining. 3d ed. 1918. Wiley $3.
Complete treatise on this type of mining operations.

Janin, C. Gold dredging in the United States. (U. S. Mines. Bul. 127). 1918. Supt. of doc. .50.

Ore Treatment

Richards, R. H. Textbook of ore dressing. 1909. McGraw $5.
Based on his standard 4 volume treatise and intended for students.

Thomson, F. A. Stamp milling and amalgamation. 3d ed. 1914. McGraw $3.
A textbook on the crushing and treatment of gold and silver ores.

MacFarren, H. W. Textbook of cyanide practice. 1912. Mining and scientific press $2.
A book for the stamp-millman, on important details of practice including arrangement and construction costs of a stamp-mill.

Del Mar, A. Tube milling. 1917. McGraw $2.
Illustrated technical description of tube mills and their applications in the grinding of ores.

Megraw, H. A. Flotation process. 2d ed. 1918. McGraw $3.50.
A general treatise, more unified and systematic than Rickard and Ralston.

Rickard, T. A. and **Ralston, O. C.** Flotation. 1917. Mining and scientific press $3.

The names of other authors appear in connection with some of the chapters, many of which were originally contributions to Mining and scientific press. Of high authority.

MacFarren, H. W. Textbook of cyanide practice. 1912. McGraw $3

A clear and adequate work on principles and fundamental operations.

Clennell, J. E. Cyanide handbook. 2d ed. 1915. McGraw $5.

Full treatise by an authority in this field.

Assaying and Metallurgical Analysis

Fulton, C. H. Manual of fire assaying. 2d ed. 1911. McGraw $2.

A standard book.

Thum, E. E. Practice book in elementary metallurgy. 1917. Wiley $2.75.

Planned especially for students of engineering in courses other than mining. Particular attention to metals that are materials of engineering.

*__Lord, N. W.__ and __Demorest, D. J.__ Notes on metallurgical analysis. 4th ed. 1916. McGraw $2.50.

Manual of the methods of chemical analysis used in metallurgy.

Low, A. H. Technical methods of ore analysis. 6th ed. 1913. Wiley $2.75.

Standard work on the methods adapted to cases most usually encountered in practice.

METALLURGY

(See also Coking and By-products)

Wysor, H. Metallurgy; a condensed treatise for the use of college students and any desiring a general knowledge of the subject. 2d ed. 1914. Chemical pub. co. $3.

Chapters on general metallurgical processes and equipment followed by brief separate treatment of the important metals.

Gowland, W. Metallurgy of the non-ferrous metals. 2d ed. 1918. Lippincott $7.50.

Much fuller treatment of the individual metals (except iron) than Wysor. English.

Hofman, H. O. General metallurgy. 1913. McGraw $6

Authoritative comprehensive work treating the subject as a whole and not in relation to each important metal separately.

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*__Pickard, H. F. K.__ Copper from the ore to the metal. 1916. Pitman .85.

A very brief outline of the mining methods and technical processes concerned. English.

Hofman, H. O. Metallurgy of copper. 1914. McGraw $5.

Important comprehensive treatise. An older book, Peters' Principles of copper smelting (1907) is still a recognized authority on fundamentals.

Hofman, H. O. Metallurgy of lead. 1918. McGraw $6.
Already accepted as an authority.

Ingalls, W. R. Metallurgy of zinc and cadmium. 1913. McGraw $6.
There is no recent book to supersede this standard work

Rose, T. K. Metallurgy of gold. 6th ed. 1915. Lippincott $6.50.
A standard.

Richards, J. W. Metallurgical calculations. 3v. in 1. 1918. McGraw $5.
Not a collection of tables and formulae, but problems in connection with all phases of metallurgical work stated and their solution indicated. Volumes are also sold separately. v. 1 Problems in combustion. v. 2 Iron and steel. v. 3 Non-ferrous metals.

Liddell, D. M. Metallurgists' and chemists' handbook; a reference book of tables and data. 2d ed. 1918. McGraw $4.
Includes little descriptive matter, but a very complete collection of data used in metallurgy.

Metallography

Rosenhain, W. Introduction to the study of physical metallurgy. 1915. Van Nostrand $3.50.
Introductory but thoroughly scientific study of the internal structure of metal and alloys, and of the inter-relations of structure, properties and thermal and mechanical treatment of metals. Plates of photomicrographs.

Edwards, C. A. Psysico-chemical properties of steel. 1916. Lippincott $4.
Contains much technical information on steel metallurgy and metallography in concise form.

Sauveur, A. Metallography and heat treatment of iron and steel. 2d ed. 1918. McGraw $6.
Important American work, fully illustrated. Same as first edition (1916) except changes in chapter 1.

Iron and Steel

(See also Foundry Practice; Electric Furnaces)

Tiemann, H. P. Iron and steel (a pocket encyclopedia) including allied industries and sciences. 2d ed. 1919. McGraw $4.
Alphabetically arranged with descriptive matter under the more general terms. Reference for definition of words and phrases is made to these descriptive paragraphs where such terms are printed in heavy type as they occur in the text.

***Spring, L. W.** Non-technical chats on iron and steel. 1917. Stokes $2.50.
Simple but excellent practical outline of production processes.

Backert, A. O., ed. A B C of iron and steel. 2d ed. 1917. Penton pub. co. $5.
By various authorities. Useful for comparatively non-technical descriptive details and illustrations of commercial practice.

*Jones, F. D. and Oberg, E. V. Iron and Steel. 1919. Industrial press. $2.50
Materials and methods of blast furnace work, rolling and other mechanical treatment, and the manufacture and uses of special steels..

*Stoughton, B. Metallurgy of iron and steel. 2d ed. 1911. McGraw $3.
A standard general treatise on production and methods of working.

Harbord, E. W. and Hall, J. W. Metallurgy of steel. 5th ed. 2 v. 1916. Lippincott $13.50.
The standard work on English practice and an important book for the large libraries. The second volume covers mechanical treatment of steel.

Hibbard, H. D. Manufacture and uses of alloy steels. (U. S. Mines Bul. 100). Supt. of doc. .10
Bulletin of about 75 pages.

Blast Furnaces

*Johnson, J. E. Principles, operation and products of the blast furnace. 1916. McGraw $5.
The best book on this important phase of the steel industry.

Johnson, J. E. Blast furnace construction in America. 1917. McGraw $4.
Of more limited use than the previous title, but an important book.

Willcox, F. H. Safe practice at blast furnaces; a manual for foreman and men (U. S. Mines. Tech. paper 136). Supt. of doc. .20

Willcox, F. H. Blast furnace breakouts, explosions and slips, and methods of prevention. (U. S. Mines. Bul. 130). Supt. of doc. .30.

Malleable Castings

Moldenke, R. G. G. Production of malleable castings. 1911. Penton pub. co. $3.
By an authority.

Heat Treament of Steel

Markham, E. R. Steel; its selection, annealing, hardening and tempering. 4th ed. 1913. Henley $2.50.
Addressed to the practical worker.

*Bullens, D. K. Steel and its heat treatment. 2d ed. 1918. Wiley $4.
Important comprehensive work.

Brearley, H. Case-hardening of steel. 1914. Spon $2.50.
Excellent book by an English authority, written for experienced artisans and foremen engaged in this line of work.

Analysis of Iron and Steel

Johnson, C. M. Rapid methods for the chemical analysis of special steels, steel making alloys and graphite. 2d ed. 1914. Wiley $3.

Blair, A. A. Chemical analysis of iron; a complete account of all the best known methods for the analysis of iron, steel, pig-iron, alloy metals, iron ore, limestone, slag, clay, sand, coal and coke. 8th ed. 1918. Lippincott $5.

COAL MINING

(See also Electricity in Mining, under Electric Engineering)

(Note: There is no American book giving a general treatise on coal mining. There are several good English books, among which are Cockin, Kerr, and Hughes, listed below. Five volumes of the International library of technology relate to coal mining. They were compiled in the heart of the Pennsylvania coal district with every opportunity for acquaintance with standard practice.

v. 37 b Gases, ventilation, fuels.
v. 38 b Hoisting, haulage, drainage
v. 86 Rock boring, coal-cutting machinery, timbering, trackwork.
v. 87 Geology of coal and examination of properties, methods of working coal.
v. 88 Surface arrangements at both bituminous and anthracite mines, coal washing, coking, etc.)

Cockin, T. H. Elementary class book of practical coal mining. 2d ed. 1916. Henley $2.50.

Kerr, G. L. Practical coal mining. 5th ed. 1914. Lippincott $4.50

Hughes, H. W. Text-book of coal mining. 5th ed. 1917. Lippincott $7.50.

International correspondence schools. Coal miner's handbook. 1913. International textbook co. $1.25

Concise manual for the miner, foreman, superintendent and others. About half on practical mining matters, the rest on introductory subjects such as mathematics, strength of materials, etc.

***Foster, T. J.** Coal miners' pocketbook. 11th ed. 1916. McGraw $4.

A standard manual of general mining practice and data, with special reference to coal mining. Matter relating exclusively to ore mining is omitted from this edition and the title modified accordingly.

Colliery engineer. Examination questions for certificates of competency as mine inspector, mine foreman, mine managers, fire boss, hoisting engineer, etc. 2d ed. 1914. International textbook co. $1.50

Relates to coal mining only. The answers are full and convey much information.

Beard, J. T. Mine gases and ventilation, a reference handbook combining theory and practice of coal mining. 1916. McGraw. $2.
Especially intended for those studying for certificates of competency in mining.

Shearer, D. R. Electricity in coal mining. 1914. McGraw. $1.50.
A concise outline of its applications without many details of apparatus.

Rutledge, J. J. Use and misuse of explosives in coal mining. (U. S. Mines. Miners' circular 7). 1913. Supt. of doc. .05.
Practical bulletin of 52 pages.

PETROLEUM MINING

***Hager, D.** Practical oil geology; the application of geology to oil field problems. 3d ed. 1919. McGraw $2.50.
Includes such practical matters as prospecting and mapping, locating drill-hole sites, factors affecting drilling and production, etc.

Johnson, R. H. and **Huntley, L. G.** Principles of oil and gas production. 1916. Wiley $3.75.
Authoritative book. Includes a long section describing the various oil fields of North America. Drilling operations receive rather brief treatment.

Bacon, R. F. and **Hamor, W. A.** American petroleum industry. 2v. 1916. McGraw $10.
A general descriptive treatise, the most complete American work on the production and refining of petroleum. Intended for general reference and as a textbook for students of petroleum engineering. The second volume treats of refining.

Bowie, C. P. Oil storage tanks and reservoirs; with a brief discussion of losses of oil in storage and methods of preventation. (U. S. Mines. Bul. 155). 1918. Supt. of doc. .25.
Bulletin of 76 pages, with folding plates.

Carnegie steel co. Steel derricks and drilling rigs for oil, gas, salt and other wells, etc. 5th ed. 1918. Author, Pittsburgh .25.

Natural Gas

Westcott, H. P. Handbook of natural gas. 2d. ed. 1915. Metric metal works, Erie, Pa. $3.50
A thoroughly practical book of information on the properties of natural gas, methods of field work, pipe lines and commercial use, and on the condensation of gasoline from natural gas.

Westcott, H. P. Handbook of casinghead gas. 2d ed. 1918. Metric metal works, Erie, Pa. $3.50
A similar practical book on the gas which escapes from oil wells and is now an important source of gasoline. The book deals especially with the recovery of gasoline from this source.

(Note: The U. S. Bureau of mines issues a series of "Petroleum technology" bulletins that are valuable where the subjects of oil and gas are of local importance.

CHEMICAL TECHNOLOGY

(See also Metallurgy)

GENERAL BOOKS

Hendrick, E. Opportunities in chemistry. 1919. Harper. 75.
A brief survey of industrial chemistry as a vocational field.

***Hendrick, E.** Everyman's chemistry; the chemist's point of view and his recent work told for the layman. 1917. Harper $2.
A very readable and at the same time reliable insight into the field of chemical industry.

Sadtler, S. S. Chemistry of familiar things. 2d ed. 1916. Lippincott $1.75
Treats in a non-technical manner the properties of air, water and food, soil, textiles and a number of other topics. Not a text-book.

Brownlee, R. B. and others. Chemistry of common things. 1914.
Simple principles of chemistry are taught in direct relation to the properties of everyday substances, for students limited to a short general course in chemistry.

Olsen, J. C. Van Nostrand's chemical annual; a handbook of useful data for analytical, manufacturing and investigating chemists. 4th ed. 1918. Van Nostrand $3.
Important manual of tabulated data revised in accordance with latest investigations. Contains a supplement of the more important books (including foreign) published since the previous issue in 1913.

Rogers, A. Elements of industrial chemistry. 1916. Van Nostrand $3.
Based on his Industrial chemistry (below) but does not include all the subjects found there. The treatment is simplified for student use. Less inclusive than Thorp and somewhat simpler.

***Thorpe, F. H.** Outlines of industrial chemistry; a textbook for students. 3d ed. 1916. Macmillan $3.75
Covers briefly the processes involved in the manufacture of a very large number of products. A short section is devoted to metallurgy.

***Rogers, A., ed.** Industrial chemistry; a manual for the student and manufacturer. 2d ed. 1915. Van Nostrand $5.
Many specialists contributed to this volume which covers most of the leading branches of chemical manufacture. A useful reference work, especially in libraries with a small collection on chemistry and manufacturing industries. (New edition is said to be in preparation, but not ready for several months.)

Sadtler, S. P. Industrial organic chemistry; adapted for the use of manufacturers, chemists, etc. 4th ed. 1912. Lippincott $5.
Treats of the raw materials, manufacturing processes, results, products, and test methods relating to the principal chemical industries based on organic materials.

Rogers, A. Laboratory guide of industrial chemistry. 2d ed. 1917. Van Nostrand $2.

Based on courses at Pratt institute in which commercial machinery and processes are used as far as practicable. Dyeing, paints and varnishes, soap and leather are among the subjects included.

Christie, W. W. Water, its purification and use in the industries. 1912. Van Nostrand $2.

Describes and illustrates the mechanical and chemical features of apparatus used to soften and purify water for use in boilers and in industrial processes.

WASTE PRODUCTS

Koller, T. Utilization of waste products. 3d ed. 1918. Van Nostrand $5.

Very comprehensive book in which animal, vegetable and mineral wastes all receive attention.

ENGINEERING CHEMISTRY

Stillman, T. B. Engineering chemistry; a manual of quantitative chemical analysis for the use of students, chemists and engineers. 5th ed. 1916. Chemical pub. co. $5.

Contains no discussion of general analytical chemistry, but gives the methods used in examining and testing a great variety of gases, liquids and solids, with which the engineer may be concerned.

Lewes, V. B. and **Brame, J. S. S.** Service chemistry; a short manual of chemistry and metallurgy and their application in the naval and military services. 4th ed. 1913. Longmans $4.75.

A standard English book. There is no American book of similar scope and purpose.

ENGINE ROOM CHEMISTRY

(See also books relating to Fuel and Combustion under Steam Engineering)

***Watkins, C. A.** Chemistry for the engineer, electrician and the practical man. 1913. Branch $2.

For the man with no knowledge of chemistry; to give him an insight into the processes of combustion, the significance of flue gas analysis, etc.

Gill, A. H. Engine room chemistry. 2d ed. 1913. McGraw $1.

A more scientific and advanced treatment than Watkins but with similar object—to enable the power plant engineer to test fuels, gases, boiler waters and lubricants.

***Gill, A. H.** Gas and fuel analysis for engineers. 8th ed. 1917. Wiley $1.25

A standard text-book on the methods and apparatus used in testing the efficiency of a boiler plant.

GAS WORKS

*Russell, H. W. Operation of gas works. 1917. McGraw $2.
Represents American practice in plants of moderate size. Water gas practice is described as well as coal gas.

Russell, W. M. and Wills, F. Chemical control of gas manufacture; practical instruction in gas works chemistry for superintendents, foremen and chemists. 1916. Gas age, N. Y. $1.50

Latta, M. N. Handbook of American gas-engineering practice. 1907. Van Nostrand $4.50
Standard work on water-gas manufacture and distribution with full details of practice.

COKING AND BY-PRODUCTS

*Belden, A. W. Metallurgical coke. (U. S. Mines. Technical paper 50). 1913. Supt. of doc. .25
Illustrated pamphlet on the development of coking practice in the United States, modern types of coking ovens, and the characteristics of metallurgical cokes.

Cooper, G. S. By-product coking. 1917. Benn Bros., Lond. 7/6.
An English book describing typical installations and processes primarily for the student. Is said to have proved useful in this country in a section where the subject is of special interest.

*Christopher, J. E. and Byrom, T. H. Modern cooking practice, including the analysis of materials and products. 2d ed. 2v. 1917. Henley. ea. $3.
Based on English practice, but probably the best recent treatise. The second volume is devoted to by-products.

Wagner, F. H. Coal and coke. 1916. McGraw $4.
Most of the book is devoted to coking practice from the standpoint of the manufacturer of coal gas. Recovery of by-products is treated in another volume (below).

Fulton, J. Coke. 2d ed. 1906. Tech. sup. co., Scranton, Pa. $3.50
On the manufacture of coke and the saving of by-products. An old publication but still considered of value for its completeness of detail.

Wagner, F. H. Coal gas residuals. 2d ed. 1918. McGraw $2.50
Complete treatise on modern American methods of recovering the by-products of the carbonization of coal. Contains a full discussion of the Feld process.

Coal-Tar Products

*Warnes, A. R. Coal tar and some of its products. 1919. Pitman $1.
Concise semi-technical outline. English.

Warnes, A. R. Coal tar distillation and working up of tar products. 2d ed. 1917. Van Nostrand $3.
Written to provide practical information for gas-works' managers and others. Plant equipment and methods are fully described. Long chapter on tarworks' tests.

Cain, J. C. Manufacture of intermediate products for dyes. 1918. Macmillan $3.50
A compilation for the benefit of would-be manufacturers giving in technical detail the most recent or best approved process.

Beacall, T. and others. Dyestuffs and coal-tar products, their chemistry, manufacture and application. 1915. Appleton $4.
Concise technical summary including allied topics—inks, sweetening chemicals, synthetic drugs and photographic chemicals.

DYES

***Pellew, C. E.** Dyes and dyeing. New ed. 1918. McBride $2.
Excellent non-technical book covering the field broadly and discussing both natural and artificial dyes and their applications. Intended for craftsmen and others using dyes on a small scale.

Ramsey, A. R. J. and **Weston, H. C.** Artificial dyestuffs; their nature, manufacture and uses. 1917. Dutton $1.75
Describes in a comparatively simple manner the production of the principal coal-tar dyes, for students with some knowledge of organic chemistry.

Fort, M. and **Lloyd, L. L.** Chemistry of dyestuffs; a manual for students of chemistry and dyeing. 1917. Putnam $2.50
Concise summary of the constitution and derivation of the principal intermediate compounds and artificial dyestuffs. Rather more difficult than Ramsay and Weston, and with less description of production processes, though outline diagrams of plant layout for certain products are given in an appendix.

Fay, I. W. Chemistry of the coal-tar dyes. 2d ed. 1919. Van Nostrand $4.
Full treatment for students well grounded in general and organic chemistry. Includes intermediate products, the interrelations of the principal dyes, and some particulars of production processes.

Textile Dyeing

***Whittaker, C. M.** Modern dyeing methods; the application of coal tar dyestuffs, the principles involved and the methods employed. 1919. Van Nostrand $3.

Knecht, E. and **others.** Manual of dyeing. 3d ed. 2v. 1916. Lippincott $14.
A standard treatise.

Knecht, E. and **Fothergill, J. B.** Principles and practice of textile printing. 1912. Lippincott $11.50
Full technical treatise including many mounted samples in the text.

Cleaning and Dyeing

Osman, E. G. Cleaning and renovating at home. Enlarged ed. 1919. Home economy book co., Wilmette, Ill. $1.20

Covers jewelry, hats, furs, etc., in addition to textile goods. Does not include dyeing.

Foster, L. E. Secrets of dry cleaning; a handy book for amateurs. 1918. Foster dry cleaning co. $1.50

Addressed also to inexperienced men in the business. Directions are explicit.

***Brannt, W. T., ed.** Practical dry cleaner, scourer and garment dyer. 5th ed. 1919. Baird $2.50

For the professional establishment.

PAINT TECHNOLOGY AND MANUFACTURE

***Sabin, A. H.** Industrial and artistic technology of paint and varnish. 2d ed. 1916. Wiley $3.50

A study of the principal classes of paints and varnishes, their manufacture and application.

Toch, M. Chemistry and technology of paints. 2d ed. 1916. Van Nostrand $4

A book based largely on original research into the properties of pigments, oils and mixed paints.

Smith, J. C. Manufacture of paint. 2d ed. 1915. Van Nostrand $3.50

Describes the machinery and processes used in grinding pigments and mixing paints, but does not provide a collection of formulae. English.

Uebele, C. L. Paint making and color grinding; a practical treatise for paint manufacturers and factory managers. 1913. Painters magazine, N. Y. $10.

Comprehensive American work. A standard work translated from the German is Zerr and Rubencamp's Color manufacture (1908 Lippincott $9.50.)

Holley, C. D. Lead and zinc pigments. 1909. Wiley $3

On the manufacture and characteristics of the more important pigments.

Scott, W. G. White paints and painting materials. 1910. Modern painter, Chic. $3.50

MISCELLANEOUS

LEATHER

*Procter, H. R. Making of leather. 1914. Putnam .40
A good outline of commercial methods presented in a non-technical way, by a leading English authority.

Adcock, K. J. Leather, from the raw material to the finished product. 1915. Pitman .85
Somewhat fuller than Procter but of similar type.

Bennett, H. G. Manufacture of leather. 1910. Van Nostrand $5.
A general work treating the subject primarily as a chemical industry but describing also the general processes and machinery.

Hides and skins, from the animal's back to the tannery door; written by specialists. 1912. Shoe and leather weekly, Chic. $5.
The first comprehensive book on hides and skins in the raw states. "Packer" hides and country hides are discussed and compared, and preparation and disinfection described. Foreign skins receive full attention.

*Flemming, L. A. Practical tanning. 3d ed. 1916. Baird $6.
The standard treatise representing American practice.

Lamb, M. C. Leather dressing. 1909.
Leather trades pub. co., Lond. $6.
On dyeing, staining and finishing, with mounted samples illustrating the process. Difficult to secure. Not listed in the regular sources of trade information.

*Procter, H. R. and others. Leather chemists's pocket-book; a short compendium of analytical methods. 1912. Spon $1.50
Of high authority. Procter has also published a comprehensive manual entitled **Leather industries laboratory book** (Spon).

Levi, L. E. and Manuel, E. V. Tanners' and chemists' handbook. 1909. Author, Milwaukee $5.
Manual of information and tabulated data for quick reference. Includes a full glossary of German and English terms used in the leather trade.

Shoemaking

*Dooley, W. H. Manual of shoemaking and leather and rubber products. 1912. Little $1.50
Excellent but not very detailed text by the principal of the Lowell industrial school.

Harding, J. S. Boot and shoe industry. 1918. Pitman .85
Concise outline with some technical details. English.

Nichols, F. H., comp. Building of a shoe. 1912.
Thos. P. Nichols & son, Lynn, Mass. $2
Very short chapters on various details by authorities in their departments.

Plucknett, F. Introduction to the theory and practice of shoe manufacture. 1916. Longmans $2.
Comprehensive English book, with full technical details.

Meck, E. N. American footwear designer. 1918.
Amer. shoemaking pub. co., Bost. $10.
Valuable book where needed, fully illustrated with large scale drawings and diagrams.

Repairing

Lawrence-Lord, D. Modern boot repairer. 1914.
C. Lockwood, Lond. 3/6
English, but apparently the only book in which repair by machinery is covered.

RUBBER

***Goodrich, B. F., co.** Wonder book of rubber; written in the Sales training department. Author, Akron, O. gratis.
Interesting short account of production and manufacture.

Beadle, C. and **Stevens, H. P.** Rubber; production and utilization of the raw product. 1911. Pitman .85
Concise outline with some technical details. English.

***Dubosc, A.** and **Luttringer, A.** Rubber; its production, chemistry and synthesis in the light of recent research. 1918.
Lippincott 6.50
Good comprehensive book. Another valuable work for the rubber factory chemist is Pearson's Crude rubber and compounding ingredients (3d ed. 1918. $10.00.)

Pearson, H. C. Rubber machinery; an encyclopedia of machines used in rubber manufacture. 1915.
India rubber pub. co., N. Y. $6.
Authoritative and fully illustrated.

Porritt, B. D. Chemistry of India rubber. 1914. Van Nostrand .75
Brief outline, including discussion of the use of waste rubber and synthetic rubber.

Caspari, W. A. India-rubber laboratory practice. 1914. Mac. $2.25
A summary of the special methods and problems of this industry for chemists of sound general training. All of these books are English. There is no recent comprehensive American work.

SOAP

Simmons, W. H. Soap, its composition, manufacture and properties. 1917. Pitman .85
Concise outline with some technical details. English.

Brannt, W. T. Soap maker's handbook of materials, processes and recipes for every description of soap. 2d ed. 1912. Baird $6
An American work for the practical manufacturer.

FOOD INDUSTRIES

*Vulte, H. T. and Vanderbilt, S. B. Food indutries; an elementary text-book on the production and manufacture of staple foods; designed for use in high schools and colleges. 2d ed. Chemical pub. co. $2.
Covers a wide range and illustrates commercial apparatus and methods.

Zavalla, J. P. Canning of fruits and vegetables; based on the methods in use in California, with notes on the control of the micro-organisms effecting spoilage. 1916. Wiley $2.50

Nowak, C. A. New fields for brewers and others active in the fermentation and allied industries. 1917. Author, St. Louis $3.
Describes those industries to which the experience and plant of the brewer are most readily adaptable.

TEXTILES

(See also Dyes)

Dooley, W. H. Textiles, for commercial, industrial, evening and domestic art schools. 1910. Heath $1.
Concise elementary textbook covering the general field in a descriptive and explanatory manner.

*Nystrom, P. H. Textiles; prepared in the Extension division of the University of Wisconsin. 1916. Appleton $1.50
A very general survey of the subject. Less in the nature of a textbook than Woolman.

Woolman, M. S. and McGowan, E. B. Textiles; a handbook for the student and consumer. 1913. Macmillan $2.
One of the best general texts, based on long teaching experience. This and Nystrom's book are helpful to salesmen and others who should understand the finished producet, rather than to textile workers.

*Barker, A. F. and others. Textiles. 1910. Van Nostrand $2.
An English book that aims to cover the whole subject concisely but accurately for those who need a broad, technically reliable background for specialized work.

International correspondence schools. [Textiles.] (International library of technology, v. 76-81). 6v. International textbook co. ea. $5.
These volumes are considered among the best practical American books on textile machinery and manufacturing operations.

Beaumont, R. Finishing of textile fabrics (woolen, worsted, union and other cloths). 1909. Van Nostrand $4.
Processes and machinery are fully described. Much space given to the theory and methods of "felting" and of "raising."

Beaumont, R. Standard cloths; structure and manufacture (general, military and naval). 1916. Van Nostrand $5.

International correspondence schools. Cotton textile worker's handbook. 1913. International textbook co. $1.25
Reference handbook of practical information on spinning and weaving and on the calculations incidental to cotton manufacture.

Peake, R. J. Cotton, from raw material to the finished product. 1910. Pitman .85

Moore, A. S. Linen. 1914. Pitman .85

Hooper, L. Silk. 1911. Pitman .85

Hunter, A. J. Wool. 1912. Pitman .85
Each of these four volumes is a convenient short summary of English production methods and manufacturing processes.

Bigwood's **Cotton** and Ormerod's **Wool** in a new series published by Constable in London (imported by Holt) are more interestingly written for the general reader but contain less technical information than the Pitman series.

Textile Design

***Barker, A. F.** Introduction to the study of textile design. 2d ed. 1915. Dutton $3.
Especially valuable for the thorough understanding given of the operations of the loom and the science of cloth construction as necessary bases of successful design.

Umpleby, F. Textile design. 1909. Amer. technical soc. $2.
"A working manual of approved practice." Author was formerly head of the textile design department at Lowell textile school.

PAPER

***Maddox, H. A.** Paper; its history sources and manufacture. 1916. Pitman .85
Concise outline intended especially for dealers and users who desire a knowledge of the principal processes of manufacture. Suitable for the general reader.

Sindall, R. W. Manufacture of paper. 1908. Van Nostrand $2.
Reliable textbook of a rather elementary type.

***Cross, C. F.** and **Bevan, E. J.** Textbook of paper-making. 4th ed. 1916. Spon $4.50
A standard work.

Sindall, R. W. Paper technology. 2d ed. 1910. Lippincott $4.50
Treats the processes of manufacture, the physical qualities of paper and methods of examining and testing; primarily for the use of paper, but with technical details of value to the manufacturer.

Stevens, H. P. Paper mill chemist. 1908. Van Nostrand $2.50

PRINTING

(Note: The most complete work on practical printing is the Typographic technical series for apprentices, in 64 small volumes at $50, per set, an official publication of the United Typothetate of America, issued in 1918. It covers several phases of the subject that have received little attention in other books and is especially good on details of method and technique.)

Francis, C. Printing for profit. 1917. Bobbs $3.
Addressed to the printer as a business man. A broad discussion based on long experience and written on a high level of intelligent endeavor.

Bashford, H. M. How to estimate on printing. 1913. Oswald $1.50

***Gress, E. G.** American handbook of printing, containing in brief and simple style something about every department of the art and business of printing. 3d ed. 1913. Oswald $2.
Useful reference handbook.

Polk, R. W. Vocational printing. 1918.
Guy M. Jones co., Indianapolis $1.25
A practice course designed for two years work in vocational schools. Composition and typographic design receive special attention and are quite fully illustrated.

***Henry, F. S.** Printing; a textbook for printers' apprentices, continuation classes, and for general use in schools. 1917. Wiley $2.25
The best textbook covering printing as a whole.

Sherman, G. Practical printing; explaining the ways and means of production in the modern printing plant. 1911. Oswald $1.50
Concise general survey giving the inexperienced an acquaintance with the work as a whole.

Typography

McClellan, G. E. Practical typography. 1913. Manual arts $1.50

De Vinne, T. L. Practice of typography. 4 v. 1900-04.
Oswald. ea. $2.

v. 1 Plain printing types. (for typemakers)
*v. 2 Correct composition (for compositors and proofreaders)
v. 3 Title pages (for compositors)
v. 4 Modern book composition (for compositors)
A series of standard books.

Trezise, F. J. Imposition. 1907. Inland printer $1.
A small practical handbook.

Sherbow, B. Making type work. 1916. Century $1.25
An aid to the advertising man and the printer, on the production of printing that is effective in fixing attention and in conveying its message.

Linotype

Thompson, J. S. Correct keyboard fingering. 1915.
Inland printer .50.

Thompson, J. S. Mechanism of the linotype. 6th ed. 1916. Inland printer $2.

Monotype

Lanston Monotype machine co. Monotype system; a book for owners and operators of monotypes. 2d ed. 1916. Author, Phila. $1.

Presswork

Robb, E. G. Presswork. 1918. William Hood Dunwoody industrial institute $1.50

A practical instruction course. A number of colored plates are included supplementing the matter on color processes.

***Spicher, C. R.** Practice of presswork. 1919. Author, Carnegie institute of technology, Pittsburgh, Pa.

A more complete work than Robb. Both give special attention to the requirements of the commercial press-room and the proper handling and care of the machines and materials used.

Oswald pub. co. American manual of presswork. 2d ed. 1916.

A standard comprehensive work for the trade.

Printing Inks

(Note: An Authoritative work for the manufacturer of printing inks, but not especially adapted to the printer, is Underwood and Sullivan's **Chemistry and technology of printing inks**, Van Nostrand. 1915)

Seymour, A. Modern printing inks, a handbook for printing ink manufacturers and printers. 1910. Van Nostrand $2.

Information well adapted to the use of the printer.

Electrotyping and Stereotyping

Partridge, C. S. Electrotyping. 2d ed. 1909. Inland printer $2.

U. S. Bureau of standards. Regulation of electrotyping solutions. (Circular 52). 1916. Supt. of doc. .10

Results of investigations conducted in cooperation with a committee of electrotypers.

Partridge, C. S. Stereotyping . . . with special consideration of the papier maché process. 2d ed. 1909. Inland printer $2.

Photomechanical Processes

Horgan, S. H. Horgan's half-tone and photomechanical processes. 1913. Inland printer $3.

Jenkins, H. Amstutz' handbook of photoengraving. 3d ed. 1907. Inland printer $3.

Lithography

***Browne, W. C.** Practical textbook of lithography. 1912. National lithographer $2.50

Standard American book. Not illustrated.

Rhodes, H. J. Art of lithography. 1914. Van Nostrand $3.50
An english book in which machinery and apparatus are fully illustrated.

Browne, W. C. Offset lithography; a treatise on printing in the lithographic manner from metal plates on rubber blanket offset presses. 1917. National lithographer $3.
Includes also a summary of photo-lithography and of tin plate decorating.

Bookbinding

Pleger, J. J. Bookbinding and its auxiliary branches. 4 v. Inland printer co.
The only American work that covers commercial bookbinding comprehensively.

1. 1 Paper ruling	$1.25
v. 2 Pamphlet binding	$1.50
v. 3 Blank, edition and job forwarding	$2.00
v. 4 Gild edging, marbling and hand tooling	$1.25

SIGN PAINTING

(Note: Three volumes of the International library of technology relate to signs and show cards. v. 67B on show cards, v. 90 on practical sign and banner making, v. 126 on commercial lettering and sign painting.)

Atkinson, F. H. Atkinson sign painting up to now. 1915. Drake $3.
Brief practical instructions followed by a series of designs with directions for the effective use of color in each case. Also many alphabets and a series of rough outlines for large outdoor display signs. Kelly's book is more valuable to the skilled worker.

Strong, C. J. Strong's book of designs. New ed. 1917. Drake $3.
Useful collection of designs, many of them in color, appropriate for signs and show cards. Contains a few alphabets.

Kelly, A. A. Expert sign painter. 1911. Author, Downingtown, Pa. $3.
Comprehensive book of practical information and suggestions (including commercial aspects) for the experienced worker. Not illustrated.

SHOW CARD WRITING

***Baker, W. J.** Baker's show card book. 1916. Author, Portland, Ore. $3.
An illustrated instruction book emphasizing alphabets and decorations that are adapted to brush work and rapid execution. The directions are to the point and the examples of work good and well reproduced.

Hurst, A. E. and **Nowak, C. J.** Hardware show card writing. 1913. U. P. C. book co. $2.
Though the examples of work are special, the text on methods is of general application and arranged in a series of progressive lessons.

Atkinson, F. H. "A show at" sho' cards. 1918. Drake $3.
Similar in makeup and treatment to his Sign painting. Both books contain some designs that are wanting in simplicity and artistic merit.

***Gordon, W. H.** Lettering for commercial purposes. 1918. Signs of the times pub. co., Cincinnati $3.
For show card writing and lettering on posters, etc. Text and examples cover lettering very fully and practically, but only a few examples of show card design are given.

SHIPBUILDING

Pease, F. F. Modern shipbiulding terms defined and illustrated. 1918. Lippincott $2.

***Kelly, R. W.** and **Allen, F. J.** Shipbuilding industry. 1918. Houghton $3.
A record of recent achievement in the U. S. and an interesting survey of the subject, with technical details. Covers the general equipment and work of a shipyard more fully than the books listed below, but is for the intelligent reader rather than the shipyard worker.

MacBride, J. D. Handbook of practical ship building, with a glossary of terms. 1918. Van Nostrand $2.
Intended to give men new to shipyard work a practical understanding of the various steps in constructing a standard cargo ship.

***Carmichael, A. W.** Practical ship production. 1919. McGraw $3.
Steel ships only. More detailed and advanced than MacBride, with special emphasis on matters of technique which most often lead to inquiry by the workman.

Holms, A. C. Practical shipbuilding; a treatise on the structural design and building of modern steel ships. 3d ed. 2v. 1916. $20.
A standard and very complete work of which the second volume comprises plates.

Hughes, C. H. Handbook of ship calculations, construction and operation. 1918. Appleton $5.
Important and useful manual. About half relates to ship construction and half to engines, boilers and miscellaneous naval machinery.

Wooden Ships

(Note: Libraries should be conservative in purchases on this subject except where local interests warrant a contrary policy. Peace conditions are expected to reduce the wooden ship to relative uniportance.)

Van Gaasbeek, R. M. Practical course in wooden boat and shipbuilding. 1918. Drake $1.50
Especially written for carpenters who wish to apply their general knowledge to this new field.

Estep, H. C. How wooden ships are built. 1918. Penton pub. co. $2.
A descriptive work with many good photographs of work in progress.

*Curtis, W. H. Elements of wood ship construction. 1919. McGraw $2.50
Practical illustrated text originally prepared for the Shipping board. Much more serviceable than Estep for actual work.

Desmond, C. Wooden shipbuilding. 1919. Rudder $10.
The most complete book on the construction of wooden ships.

Naval Architecture

(Note: For advanced study, Peabody's Naval architecture (Wiley) is a full general treatise; and Robinson's Naval construction (U. S. Naval institute) a text-book having special reference to naval vessels.)

Desmond, C. Naval architecture simplified. 1918. Rudder pub. co. $5.
A clear and practical treatment of the elements of this intricate subject, sufficient for the design of boats and small ships.

Desmond, C. Laying down and taking off. 1919. Rudder pub. co. $2.
Explains how to enlarge to full size the lines given in a design of a ship, and how to get the correct shapes and sizes of the timbers required.

Attwood, E. L. Text-book of theoretical naval architecture. New ed. 1916. Longmans $3.
This and the following title are standard texts preparatory to advanced study, differing in this respect from Desmond.

Attwood, E. L. and Coopes, I. C. C. Text-book of laying-off or, the geometry of shipbuilding. 2d ed. 1918. Longmans $2.

NAVIGATION AND SEAMANSHIP

(With special reference to the merchant marine.)

MacArthur, C. E. Navigation simplified, or the seaman's assistant and self-instructor. 2d ed. 1919. Rudder $1.25
New edition of a book on practical methods for men whose mathematical knowledge is very limited.

Jacoby, H. Navigation. 2d ed. 1918. Macmillan $2.25
One of the best and most complete elementary works, better adapted to home study than Draper.

Draper, E. G. Navigating the ship, a series of lessons in elementary navigation. Van Nostrand $1.50
Based on a course of lectures in use at the U. S. Naval auxiliary school.

Bradford, G. Whys and wherefores of navigation. 2d ed. 1918. Van Nostrand $2.
Supplementary to the formal texts, and considered one of the important books for students and for navigators of limited training.

Henderson, W. J. Elements of navigation; a complete exposition of the newest methods as used in the navy and merchant marine. New ed. 1918. Harper $1.25.
Good concise manual.

Muir, W. C. P. Treatise on navigation and nautical astronomy, including the theory of compass deviations. 4th ed.
U. S. Naval institute $4.20
The standard textbook at the Naval academy.

Bowditch, N. American practical navigator; an epitome of navigation and nautical astronomy. 1918.
U. S. Hydrographic office $2.35
Indispensable to the practical navigator and to libraries where navigation is a live subject. Frequently revised under Government direction.

Lecky, S. T. S. Wrinkles in practical navigation. 1919.
Van Nostrand $5
Authorized facsimile of the 18th English edition of a classic heretofore priced at double this sum. "An officer who does not know this book—well, he is simply not all there as an officer."

Seamanship

Doane, E. P. Seamanship. 1918. Rudder $1.25.
Addressed especially to men seeking a general knowledge preparatory to entering the merchant marine or navy. Rather slight.

***O'Donnell, E. E.** Merchant marine manual. 1918.
Yachtsman's guide $1.
Originally prepared for apprentices under the U. S. Shipping board. Illustrated manual full of concise information including marine engines, rope work and rigging, and other subjects not covered by the Naval school lectures, below.

U. S. Naval auxiliary school of seamanship. Lectures on modern seamanship. 1919. Van Nostrand $2.
Authoritative outline adapted to the rapid preparation of men for officers on mercantile vessels under Navy control. Not illustrated.

Knight, A. M. Modern seamanship. 7th ed. 1918.
Van Nostrand $6.50
The standard American work. Also published in a $3.00 edition that will be satisfactory in libraries where a heavy demand is not expected. Complete, but less adapted to hard use and rebinding than the regular issue.

Riesenberg, F. Men on deck; master, mates and crew, their duties and responsibilities; a manual for the American merchant service. 1918. Van Nostrand $3.
A compilation of information covering the chief things that officers and men should know about their duties and about the laws and regulations governing their calling.

Hayne, D. H. Manual of the rule of the road at sea and precautionary aids to mariners. 2d ed. 1912.
Co-operative pub. co., Baltimore $3.25
An important book on all that relates to the proper handling of a vessel in the presence of other vessels to facilitate traffic and avoid collisions.

Uttmark, F. E. Guide to U. S. local inspectors' examination for masters and mates of ocean-going steam and sailing vessels. 4th ed. 1919. Author, N. Y. $3.50

CABINETWORK

***Griffith, I. S.** Radford's manual training; or home furniture maker and amateur craftsman. 2v. 1914. Radford $3.
Much of the material appeared in American carpenter and builder. The directions are practical and explicit and the designs are good.

Rudd, J. H. Cabinet making; principles of designing, construction and laying out work. 1913. Benn bros., Lond.
Written with both the professional worker and the trade school student in mind. English book of which there was an American edition that is no longer in print.

Otter, P. D. Furniture for the craftsman. 1914. U. P. C. book co. $2.
Part of the material appeared under the title Cabinet work for the carpenter in the periodical Building age. Many of the designs are lacking in artistic merit.

***Wells, P. A.** and **Hooper, J.** Modern cabinet work, furniture and fitments. 1910. Batsford, Lond.
An English book that is probably the best on the subject. It was published by Lane in this country at $5, but the American edition is reported out of print.

Schmidt, W. K. Problems of the finishing room. 1916.
Periodical pub. co., Grand Rapids $5.
For the professional furniture finisher. Information and formulae for all the usual methods of staining and finishing.

Nye, A. C. Furniture designing and draughting; notes on the elementary forms, methods of construction and dimensions of common articles of furniture. 3d ed. 1914. Comstock $2.
A book that is excellent on both the practical and the artistic side of the subject.

PHARMACY

(Note: This subject may seem to be outside the natural scope of this list, but it is thought that a few titles will be useful.)

***O'Connor, D. C.** Treatise on commercial pharmacy; intended as a reference book and a textbook for pharmacists and their clerks. 2d ed. 1913. Lippincott $3.
On the business aspects—management, advertising, etc.—and on the handling of the general stock that forms a large part of most drug store sales.

Ruddiman, E. A. Pharmacy, theoretical and practical, including arithmetic of pharmacy. 1917. Wiley $1.75
Intended to be used in conjunction with the **Pharmacopoeia** and **National formulary**, and limited to "essential facts which every pharmacist should know."

***Caspari, C.** Treatise on pharmacy for students and pharmacists. 5th ed. 1916. Lea $4.75
A standard general work.

Sollman, T. Action of drugs; a course of elementary lectures for students of pharmacy. 1917. Saunders $1.50

Scoville, W. L. Art of compounding; a textbook for students and a reference book for pharmacists at the prescription counter. 4th ed. 1914. Blackiston $3.
Includes a chapter on biological products.

Ludy, R. B. Answers to questions prescribed by pharmaceutical state boards. 2d ed. 1917. McVey $2.50

SUBJECT INDEX

Columbian Printing Co., Inc.
Washington, D. C.